The Magazine of the Registered Professional Engineer

American Engineer

DECEMBER 1959

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AE Photo Story:
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Consulting
Education
Government
Registration

ason's Greetings

WHY I LIKE WORKING FOR A SMALLER COMPANY

By Wayne E. Ault, P. E.

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P.S.: Show this page to your advertising manager—he'll be pleased you did!

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Product	Amount Purchased Annually
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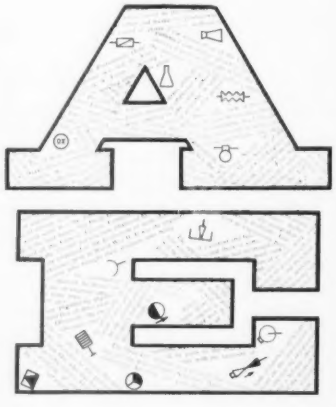

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Paul E. Reece, Assistant to the Editor

Staff Writers: John T. Kane, Joseph C. Lewis

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Letters to the Editor

Titles . . .

Dear Editor:

In the September, 1959, AMERICAN ENGINEER, it was reported that the Bay State Abrasive Products Company of Westboro, Mass., is the latest industrial firm to announce that it will restrict the title "Engineer" to those who are registered professional engineers. The article gives the new titles which will replace those containing the word "Engineer" and in that connection it states "In the Research and Development Department and in the Quality Control Department, the term 'Chemist' or 'Ceramist' shall replace the term 'Engineer'."

As a member of the National Society of Professional Engineers I concur in this decision, but as a Fellow of the American Institute of Chemists, an organization which has similar aims for chemists as the NSPE has for engineers, I ask if those who are now to be called "Chemists" are really chemists or are they to be called such solely to avoid calling them engineers.

A chemist is a person who is trained in chemistry and related subjects and is engaged in the application of that training to problems of a chemical nature. The title therefore denotes a professional status and should not be lightly applied to those who perhaps should be called some sort of technician.

T. FINNEGAN, P.E.
Buffalo, N. Y.

Auto Safety . . .

Dear Editor:

Through bitter experience and serious injury I was a particularly interested reader of the article in your October, 1959, issue entitled, "Will Engineering Advances Reduce our Traffic Deaths?"

In circumstances on which I need not enlarge here, a car unexpectedly collided with my 300 HP, 1958 Model, on the right, sharply deflecting it leftwards and tipping me over on my seat. In an unfortunate attempt to regain control, my right foot slipped onto the gas pedal and the car shot into a tree. Since I was not behind the steering wheel, I was projected into the dash. The right femur and knee sustained multiple fractures, the left knee was fractured but not seriously, three ribs were fractured on the side of the steering wheel and my upper teeth were knocked out on the upper part of the dash, which was fortunately padded, otherwise the facial injuries would have been much worse.

Firstly, seat belts would very probably have prevented my losing control of the car. The other wise provisions summarized in your article, in particular, the padding of the dash, would have greatly mitigated the injuries. I believe very strongly the automobile industry should take the suggestions made by crash-injury experts much more seriously.

From advance sales literature on the new Mercedes-Benz 220S Models, I quote the following:

"The lower center of gravity increases the safety. The factory put special emphasis on the interior safety by means of: Padded center knob of steering wheel; padded dashboard; padded sun visors; switches, armrests, etc., made of soft material; rearview mirror disjoints at a pressure of 16 pounds; padded window facings and center post, and recessed door handles."

If, thanks to the highly skilled surgery and treatment I have received, I leave the hospital in good enough shape, my next car will be a Mercedes-Benz.

As a native of Switzerland and an alumnus of the Federal Institute of Technology, Zurich, may I also congratulate you on your excellent review of Swiss industry "Engineering—The Swiss Word for Success."

J. B. SCHUBELER, P.E.
Rockford, Ill.

Facts of Life . . .

Dear Editor:

Our executive director wrote a full page on total professional development (October AE) and had no space left for the facts of life. I offer the following in extension of the essay of our executive director:

(1) Learn the technique. Remember no man can know all of it.
(2) Pay the political fee for protection. Each state has its price, and all cities must have their cut.
(3) Stand in the market place and announce your profession. Don't be ashamed of your profession whatever it is and remember that engineering is at the top of the list of good professions.

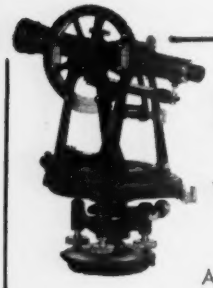
When you have taken these three steps you have accomplished your total professional development. So many engineers never go beyond the first step.

R. B. MACFARLANE, P.E.
Richmond, Va.

The Metric Debate . . .

Dear Editor:

. . . [You] and your able staff are to be complimented on the article titled "The Great Debate: Should We Adopt the Metric System?" beginning



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(Circle 1 in Readers' Service Dept.)

on page 23 of the September, 1959, issue of AMERICAN ENGINEER.

With the many complications that already exist in the world, to continue to condone the added complication of a needless conversion from the metric to the English system seems ridiculous indeed. The difficulties that will be encountered in a change-over will be minor in comparison to the increasing difficulties that two different measuring systems will have on one earth.

I hope the point of public re-education will not be overemphasized as the wives of GI's in Europe and Japan and the tourists of the world seem to adapt fairly easily to the metric system.

I sincerely hope that your important Society will put its full weight behind the move to adopt the metric system of measurement.

REXFORD WILSON, P.E.
Boston, Mass.

Metric Overseas . . .

Dear Editor:

I am pleased to note the interest in adopting the metric system of weights and measures, as described in the September issue. However, I find it difficult to understand how the question can still be described as a "great debate." The metric system is inherently so vastly superior to the English system in its ease of manipulation that every engineer, scientist, business man and housewife ought to be delighted at the prospect of its becoming the official standard.

It is not to our credit, in the eyes of many "underdeveloped" nations, that we have clung so tenaciously to a system so grossly awkward as the English system. We must demonstrate to others that we, too, are still able to make fundamental changes when it is to our obvious advantage to do so. Some extra effort, a short period of confusion now, will save much time, money and effort for us and our descendants.

I strongly urge AMERICAN ENGINEER to press relentlessly for the speedy, official adoption of the metric system.

WILBUR J. WHITSELL, P.E.
San Jose, Costa Rica

Metric for Complicated World...

Dear Editor:

I certainly wish to compliment you upon your article in the September issue of AMERICAN ENGINEER concerning the adaptation of the metric system. As this world becomes more complicated and the international exchange of ideas increases, the use of the metric system will become a necessity and we see no reason why all of our students need learn two systems of measurement when only one is necessary.

WILLIAM F. RYAN, P.E.
Salina, Kan.

More on Metric . . .

Dear Editor:

Thank you for the splendid article in the September, 1959, issue titled "The Great Debate: Should We Adopt The Metric System?" An error on Page 26, paragraph 4, read: (For example the inch equals 25.4 centimeters.) The decimal should have appeared after the 2 to read 2.54 centimeters.

The average American wants to learn the metric system as may be witnessed by members of camera clubs, gun clubs, science clubs and numerous others who use the metric system, many members having had comparatively little education. I think the transition would take time but would not be nearly as difficult as it would appear since a fair percentage of our population is already well-informed.

Under government sponsorship, metric measurements could be taught in all public and private schools immediately and all packaging and bottling labels made to conform. The machine tool industry might not object too strongly due to the enormous new market which would be created and the excuse would be provided to junk much of American industry's obsolete equipment.

R. EMMET DOHERTY, P.E.
Northampton, Pa.

Swiss Article . . .

Dear Editor:

We congratulate you on the article "Engineering — the Swiss Word for Success" beginning on page 25 in the October edition of the AMERICAN ENGINEER.

It is a subject, of course, on which we are not exactly neutral: For more than 30 years Brown Boveri Corporation has been telling the story of Swiss craftmanship and engineering skill to the American market. We believe your article sums up this story beautifully.

THOMAS E. LUCIER, MANAGER
Public Relations,
Brown Boveri Corporation
New York, N.Y.

"P.E." in Dictionaries . . .

Dear Editor:

I have not been able to find a dictionary yet which lists "P.E." as an authorized abbreviation for "Professional Engineer" while all of the dictionaries list "M.D." as an authorized abbreviation for "Medical Doctor."

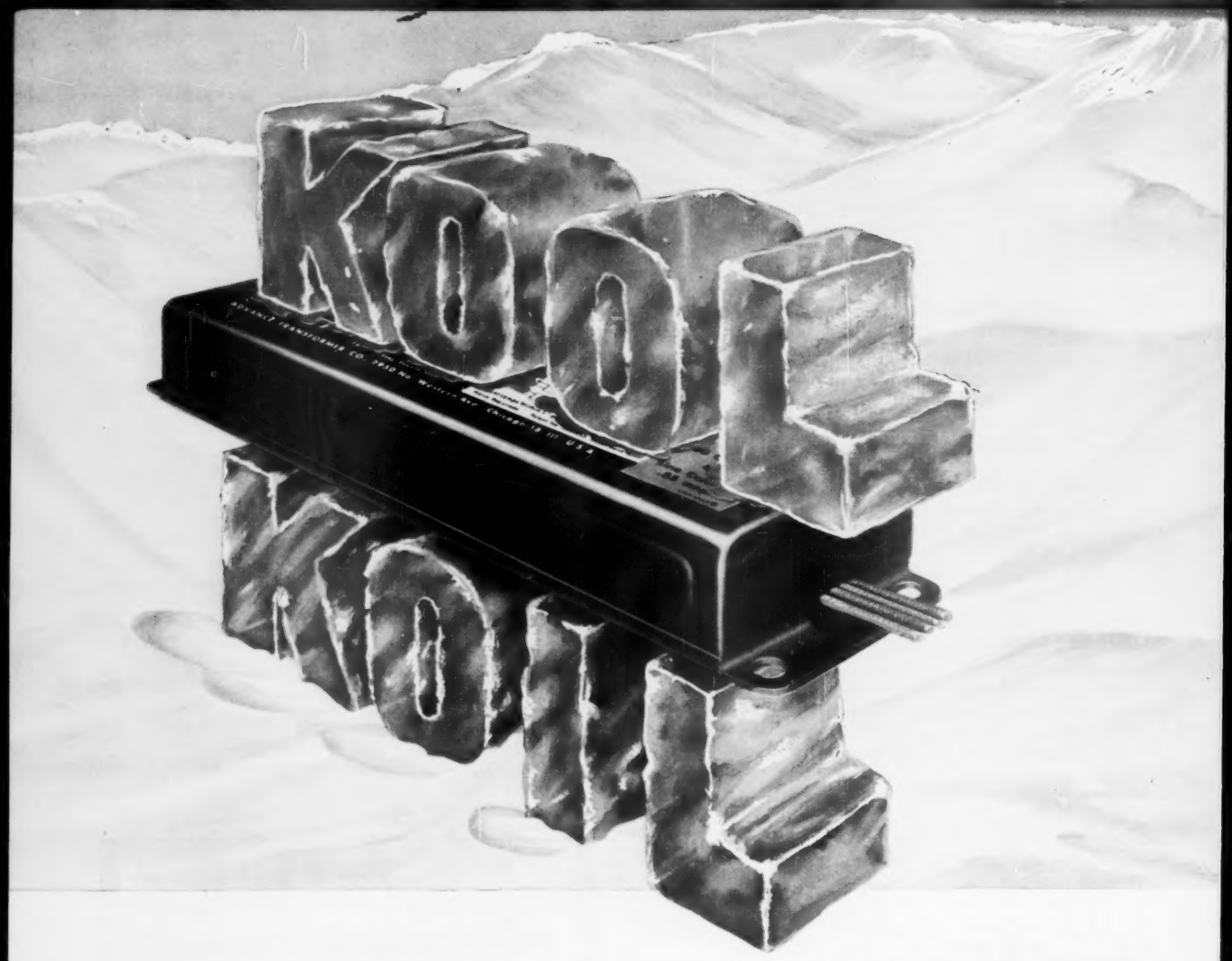
It would seem to me that in order to obtain wide spread public recognition, a dictionary listing of our "P.E." suffix would be essential.

I would suggest that the NSPE advise and remind—by correspondence—the dictionary publishers until this objective is obtained.

DONALD C. JENKINS, P.E.
Portsmouth, Va.

► **Editor's Note: This will inform Reader Jenkins that his letter has been passed along to the NSPE Public Relations Committee for suggested action.**

(Circle 2 in Readers' Service Dept.)



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"This Month"

The majority of our engineers work for industry, large and small. Is the engineer better off in a smaller industrial organization? "Yes!" says a leading engineer in a Midwest fire protection company and he backs up his arguments in an article beginning on page 17. Next month: The other side of the story, "Why I Like Working for a Larger Company," by a General Electric executive.

Engineers are desperately needed as executives and yet too many fail to perform when the opportunity is granted. What can industry and the profession do to better equip engineers for administrative positions? See "The Anatomy of Executive Leadership," Page 23.

And on page 26 an AE Photo Story focusing the lens on engineering works at Cape Canaveral. A staff reporter covers this fascinating installation with the engineer in mind.

Short but important: A report of the McCamy Case which is now before a special New Jersey board to determine whether Engineer McCamy practiced architecture when he designed two edifices. Page 31.

In the news "This Month:"

General. Page 8. The American Chemical Society reports that chem engineer salaries are up all along the line with the largest of 3.7 per cent going to Ph.D.'s.

In another story, page 9, the AE reports with regret the passing of Cherry L. Emerson, noted educator, and frequent AE author.

Consulting. Page 10. The Dept. of Agriculture has apologized for having said in regulations that consulting engineers and surveyors could not be trusted to measure acreages accurately. Another item lists four new publications of interest to consultants, also on page 10.

Education. Page 12. The stories: Need of Teachers Stressed at Tau Beta Pi Convention . . . Dr. Morgen Installed as President of Rose Polytechnic . . . Kodak Contributes $600,000 to Education . . . and others.

Government. Page 14. Salaries and classification plans for Federally-employed engineers are currently receiving the serious attention of the House Civil Service Committee. In other news: The Bureau of Labor Statistics will seek more wage data in surveys so that they can better compare rates paid engineers in private employment with Federal employees.

Registration. Page 15. Underwriters' Labs has moved behind an ambitious program to support registration and society membership. Also: The Bureau of Public Roads asks engineers to display licenses.

That's it for "This Month." Season's Greetings to all from the AE staff!

Kenneth E. Trombley

Editor

Salary Increase Noted for Chemical Engineer Graduates

An average three per cent increase in starting salaries over last year is reported by the June, 1959, class of graduating chemists and chemical engineers in an American Chemical Society survey. Largest increases went to masters and doctors in both fields.

The 3.7 per cent increase reported by inexperienced Ph.D. graduates in chemistry raised their median starting salary from $675 per month in 1958 to $700 in 1959. Close behind were masters in chemistry who went from $511 to $525, a 2.7 per cent increase. In chemical engineering, inexperienced Ph.D.'s increased their 1958 salary of $700 by 3.6 per cent to $725. Masters went from $541 to $560, a 3.5 per cent gain. Bachelors in chemical engineering were reported at $490.

The ACS survey notes the improved economic status for those with some experience, generally gained from summer work or cooperative work-study programs. Using twenty-six weeks to separate the inexperienced and experienced, the survey shows $475 as compared to $434 in the case in bachelors in chemistry, and $500 for bachelors in chemical engineering.

In other findings, there was a sharp drop in the number of chemists and chemical engineers from the South Atlantic area of the country. In 1958, eighteen per cent of bachelors in chemical engineering were in that area, whereas in 1959 the figure was 12.5 per cent. In employment choices, 88.1 per cent of the chemical engineering graduates accepted industrial employment, compared to 62.9 per cent of chemical bachelors. Nearly ten per cent of the B.S. chemists went to work for the Government, while only 2.2 per cent of Ph.D.'s did so. Among chemical engineers, 5.4 per cent took government jobs. Research institutions attracted 15.4 per cent of chemical bachelors, but 27.4 per cent of the Ph.D.'s were inclined to teaching institutions.

In general, the survey finds, salary patterns for chemical engineers are little affected by considerations of geographic locale or type of industrial position, but the same does not hold for chemistry graduates. There appears to be little unemployment in the chemical profession in 1959.

Reprints of the survey are available upon request from the American Chemical Society, 1155 Sixteenth St., N. W., Washington 6, D.C.

At ASCE Meeting

Francis S. Friel, left, a member of NSPE and president of the American Society of Civil Engineers, presents Herbert A. R. Austin, a Hawaiian engineer, with an honorary membership in ASCE at the national convention of ASCE held in Washington recently.

Annual ARBA Meeting Slated January 18-21

Congressional leaders in the highway field will answer questions propounded by a panel of trade press editors and publishers as a special feature of the fifty-eighth annual convention of the American Road Builders' Association in Cincinnati, January 18-21.

Harold L. Plummer, chairman of the Wisconsin State Highway Commission and an ARBA vice president, will be the moderator of the discussion which will find the editors seeking the answers to such questions as:

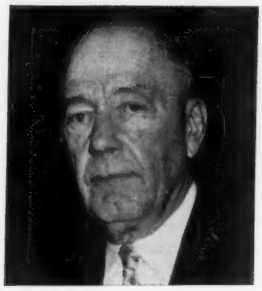
Will Interstate System design be modified? How much of a stretchout, if any, is in prospect? How long will "reimbursement planning" be in force? What will be the likely effect of the investigations of the highway program now underway?

Senators who have been invited to participate include Sen. Dennis Chavez (D-N.M.), chairman of the Public Works Committee; Sen. Patrick V. McNamara (D-Mich.), chairman of the Subcommittee on Public Roads; Sen. Francis Case (R-S.D.), ranking minority member of the Public Works Committee, and Sen. Jennings Randolph (D-W.Va.), member of the Subcommittee on Public Roads.

Those who have been invited to date from the House of Representatives include Rep. George H. Fallon (D-Md.), chairman of the House Subcommittee on Roads, and Rep. Gordon H. Scherer (R-Ohio), ranking minority member of the Subcommittee.

Cherry L. Emerson Dies; Distinguished Educator

A former vice president of the National Society from 1949 to 1951, Cherry L. Emerson, died recently at Atlanta, Georgia. Mr. Emerson, 71, had a distinguished



Cherry L. Emerson

career in both industry and education.

He served as vice president of the Georgia Institute of Technology until retiring in 1955. Recently, he had been associated with the firm of Thomas Bradbury, Architect of Atlanta.

A graduate of the Georgia School of Technology with a B.S. degree in mechanical engineering in 1908, and a B.S. in electrical engineering in 1909, he began his engineering career as an apprentice with the Westinghouse Electric & Manufacturing Company at Pittsburgh in 1909.

He worked in various capacities for Westinghouse at Boston, Philadelphia, and Charlotte, N.C., before becoming an application engineer with the Duke Power Company in Charlotte. He later became chief engineer for the Duke Power, then chief engineer of Robert and Company, Inc., of Atlanta, and finally, dean of engineering at Georgia Tech in 1945. In 1948 he became vice president of the school.

His most recent effort on behalf of NSPE was his membership on the Policy Review Committee for 1959-60.

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Agriculture Department Corrects Misunderstanding

The Department of Agriculture has apologized and promised to revise regulations which implied that consulting engineers or surveyors could not be trusted to measure cotton acreage accurately under a Federal agricultural program. The objectionable regulation said while private professional measurements had been accurate, there was the possibility of the professional "tending to the position of the person retaining his services . . . (and) might be influenced by virtue of their relationship with the farmer."

The California Council of Civil Engineers and Land Surveyors protested to Senator Thomas H. Kuchel of California, and NSPE advised Secretary of Agriculture Ezra T. Benson that the Society objected to the inference that the professional consultant would act contrary to the Canons of Ethics. In both cases the Department said the objectionable language would be deleted and was not intended to carry "any implication derogatory to the profession of surveyors and engineers."

The misunderstanding arose out of the Department's interpretation of the law that the cotton measurements must be handled by Department employees under the supervision of a local county committee.

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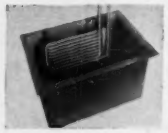

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Kansas State C. of C. Amplifies Policy

The Kansas State Chamber of Commerce, in response to a statement of principles presented by the Consulting Engineers Section of the Kansas Engineering Society, has amplified its policy favoring private enterprise to specifically refer to professional services.

In a letter to Functional Section Secretary-Manager Donald P. Schnacke, the Kansas Chamber also referred to the position of the U.S. Bureau of the Budget of September 21, 1959, favoring the procuring of goods and services "from private enterprise through ordinary business channels . . . because the private enterprise system is basic to the American economy."

New Report Issued On Highway Services

"Scope of Services Performed by Consultants on Express Highway Projects in the U.S.," is the title of a new report of the Committee on Professional Engineering Services, Engineering Division, American Road Builders' Association.

The report closely defines the scope of services and offers guidelines for the negotiation of fees. Covered are sections on traffic studies, route location and reconnaissance report, engineering design report, surveys and base maps for final design, final design and preparation of contract plans and documents, supervision of construction and definition of fees and notes.

For a copy of the report write to ARBA Engineering Division, 600 World Center Bldg., 918 16th St., N. W., Wash. 6, D. C.

Recent Publications of Interest to Consultants

• Hearings on the Self-Employed Individual's Retirement Act of 1959 (Keogh-Simpson Bill, H.R. 10) held before the Senate Finance Committee, 1959. The 406-page publication, including the statement of NSPE's witness, Robert C. Vogt, spells out in fine detail the need for and effect of the bill on self-employed persons. For a copy, contact one of your senators.

• "Compensation For Engineering Services," by Frank W. Edwards, P. E., prominent Illinois consulting engineer. Reprinted from *The Illinois Engineer,* the one-page discussion reviews proper selection and fee principles and procedures. For copies, contact ISPE Executive Secretary L. C. Goddard, Room 817, Myers Bldg., Springfield, Ill.

• "Competitive Bidding — For Engineers?" by Charles J. Wurmfeld, president, New York Chapter, published in July-August issue, *New York Professional Engineer.* The New York consulting engineer deals with the background development leading to the present thinking outlawing competitive bidding for professional services. The magazine is published by the New York State SPE, 1941 Grand Central Terminal Bldg., New York 17, N. Y.

• **The Bulletin of Engineering and Architecture,** No. 4, published by the School of Engineering and Architecture, University of Kansas, Lawrence, carrying the papers at the ninth annual conference on sanitary engineering, includes two of special interest to consulting engineers: "Engineering Ethics for Consultants on Public Projects," by Donald P. Schnacke, secretary-manager, Consulting Engineers' Section, Kansas Engineering Society; and "Specifying and Purchasing Equipment for Municipal Construction" by L. M. Van Doren of Servis, Van Doren and Hazard, Topeka consulting engineers.

Why You Should Join the Functional Section for Consulting Engineers!

Through the Functional Section for Consulting Engineers in Private Practice, members of NSPE have the opportunity and machinery to be active in the furtherance of private practice interests within the framework of the professional society.

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1. **The Functional Section is taking vigorous action to combat the recent Congressional criticism of the use of consulting engineers. A comprehensive and detailed survey of fees on Federal projects is in progress.**

2. **One of the Task Forces is hard at work to improve the NSPE-approved liability insurance for consultants.**

3. **The Task Force which prepared the recent Fee Manual has broadened its scope to cover additional practice problems.**

4. **Other task forces are working to improve the Functional Section organization, and ethical aspects of consulting practice. Specific work is being performed on problems of free engineering advertising, engineer-architect relations (standard contract forms have been prepared), and a complete national roster of consulting firms.**

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Need of Teachers Stressed At Tau Beta Pi Convention

Delegates representing the nation's top engineering students were recently urged to help recruit their colleagues for careers in engineering teaching.

"Events of the next twenty years will give the nation's engineering teachers unprecedented importance and status," Dr. Harold L. Hazen, dean of the Graduate School at the Massachusetts Institute of Technology and chairman of a special committee of the American Society for Engineering Education, told delegates to the 1959 annual convention of Tau Beta Pi at Purdue University.

At least 1,000 new engineering teachers will be needed each year through 1967, Dean Hazen reported to the honor students, representatives of engineering honor societies in leading colleges throughout the country.

Only the most able and creative of America's engineering students can fill the demands of engineering teaching. "In this hall today," Dean Hazen said, "is the group that at the present moment has the greatest opportunity to exercise leadership in teaching tomorrow's engineers."

Professor Harold L. Foecke, director of the ASEE Committee on the Development of Engineering Faculties of which Dean Hazen is chairman, pointed out that a 1957 survey found that about thirteen per cent of the nation's engineering teaching jobs were then filled unsatisfactorily or not at all. Growing engineering enrollments will require a sixty per cent increase in the number of engineering teachers by the end of the next decade. To meet these needs, engineers must enter the teaching profession "at a wholly unprecedented rate," Professor Foecke said.

The growing need results from population increases, the greater emphasis on higher education in all fields, and the "almost explosive rate of growth of applied science and engineering in the cultural and economic pattern of this country," Dean Hazen declared.

Would-be teachers in the Tau Beta Pi audience at Purdue were advised to continue their education into graduate work. "Experience indicates that if you enter full-time employment, when you graduate," Dean Hazen said, "the chances that you will ever enter teaching are small."

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Morgen Installed Pres. Of Rose Polytechnic

Ralph A. Morgen was officially installed as president of Rose Polytechnic Institute during inauguration ceremonies on November 20.

Dr. Ralph A. Morgen

He is the ninth president of the Terre Haute, Ind., school.

A native of Sacramento, Cal., Dr. Morgen received his B.S. degree with honors from the University of California in 1923 and the Ph.D. degree from this institution in 1925. From 1924 to 1926 he was a teaching assistant at the University.

He was a development engineer of Western Electric Company from 1926 to 1928. For five years he was manager of the research division of Cleaners Equipment Corporation and had his own business for five years as a consulting chemical engineer.

Dr. Morgen, an NSPE member, joined the faculty of the University of Florida at Gainesville in 1938 as professor of chemical engineering. He was named, in addition, assistant director of its Engineering and Industrial Station in 1943 and its director in 1947. He served in these capacities until he left in 1952 to be program director for engineering for the National Science Foundation in Washington.

Dr. Morgen became research director of the Purdue Research Foundation in 1954 and in 1956 was named Assistant to the President for Research at Purdue University. He began his duties as president of Rose Polytechnic Institute on September 1, 1959.

Enrollment Decrease Blamed on 'Sputnik'

The fall-off in the number of young people now entering engineering schools has been blamed on "Sputnik fever" by Dean Dale R. Corson of the Cornell University College of Engineering. "Sputnik fever," he said recently, drove many potential engineers to study science instead of engineering when it hit the United States two years ago.

Addressing the Cornell University Council on the problems that face engineering educators today, he said: "In the fall of 1958, freshman engineering enrollments were down 11 per cent on the average all over the country. This year, the number of applications was down again . . .

"By every way we have to judge ability, the quality is higher than normal this year. I think these trends in enrollment are, to a considerable degree, the result of the Sputnik fever which hit us two years ago. There has been a great deal of talk about science in these two years and many students who would have gone into engineering ordinarily have gone into science instead.

"I think that much of this talk has been misplaced. The satellite and rocket achievements have been engineering achievements, not science achievements, although some of the measurements which have been made with the satellites have scientific interest."

Kodak Contributes $600,000 to Education

Aid-to-education contributions amounting to more than $600,000 have been announced by the Eastman Kodak Company. Under the company's program this year, seventy-five direct grants and forty-four fellowships were awarded American colleges and universities.

During the past five years, Kodak's total expenditures under the plan have amounted to more than three million dollars.

MIT Head Stresses 'Quality'

The goal of the Massachusetts Institute of Technology is "to provide the model of excellence in an age when science and technology have become the dominant forces of society," Dr. Julius A. Stratton, president of M.I.T. told members of the Corporation in his annual report.

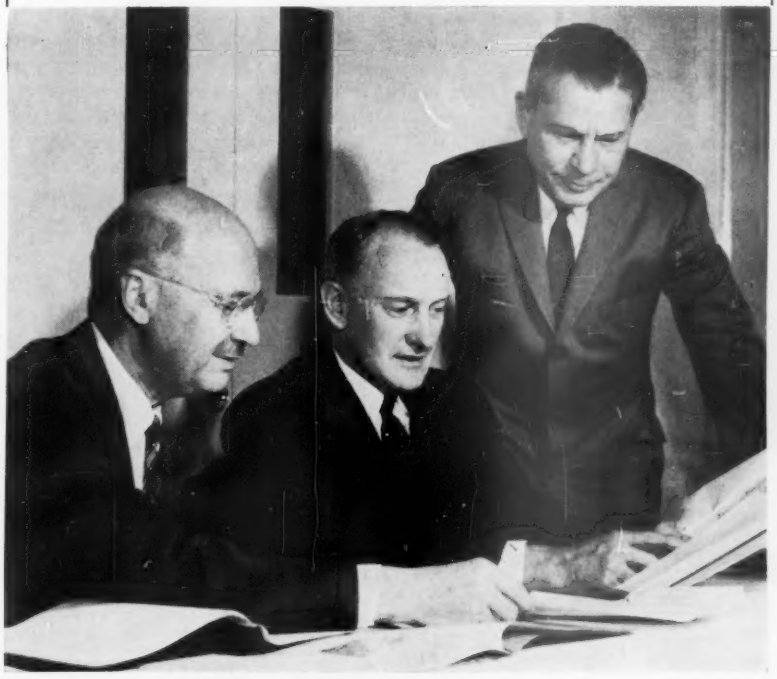
He termed the nation's growing demand for higher standards in its schools and colleges "the most significant development of this year," and said that M.I.T. can "contribute most to the national interest by an even greater concentration upon the quality of its education.

"We must recognize that the United States has concluded a rather free and easy epoch in its national history. There lies ahead a new order of competition, a challenge to our mode and standards of living—not only from the Soviets, but also from newly developing countries on every continent.

"To meet this rising tide of competition, we shall have to rely even more upon the quality of our products and services than upon their bulk. For our schools and colleges this means that a moderately good education for all is still a necessary, but no longer adequate, national aim.

"We must now make still greater efforts to provide opportunity and facilities for the superb education of that relative few who are highly gifted and who give promise of creative leadership," he said.

Engineering Scholarship Judges



A panel of eminent professional engineers recently selected the winner of a $500 engineering scholarship contest, sponsored annually by the Nassau County Chapter of the New York State SPE. The contest, open to all Nassau County high school juniors, encompassed an original "engineering" design for a community improvement. The entries were judged by, l.-r.: Professor Anatole Gruehr, president of the New York State Society; John Kyle, chief engineer of the Port of New York Authority, and Sidney Shapiro, chief engineer of the Long Island State Park Commission.

Salary Study is Underway for Government Engineers

Salaries and classification plans for Federally-employed engineers and scientists are currently receiving the serious attention of the House Civil Service Committee in its comprehensive study of the entire Federal classified pay system. According to latest reports, the study is half completed and will be followed by recommendations for legislative action early in the next Congressional session.

Charles E. Johnson, counsel to the House Committee, recently said that because a critical shortage of engineers and scientists still remains in Government service, any new pay system proposed by the Committee must provide for adequate compensation for professional employees. The present system, he said, is completely lacking in provisions which permit effective recognition for the relative value of each individual's contribution. Excessive emphasis is placed on the average employee, he continued.

Johnson also stated that the proposed new pay system will be geared primarily to professional employees, and will probably contain provisions vesting flexible authority in administrative heads to set, within prescribed ranges, the salaries of their employees. A degree of salary flexibility is considered imperative if the Federal Government is to maintain a competitive position in the recruitment and retention of engineering and scientific personnel, he said.

According to Johnson's personal opinion, the Government's biggest mistake was the abandonment of the old "P" ratings for professional employees, under which professional employees were classified in a separate schedule and paid accordingly. This statement coincides perfectly with the official NSPE position on the classification and salaries of Federal engineers.

In the past, NSPE has strongly backed the Moss-Gubser bill which would establish a separate classification and pay system for professional employees and will continue to press for enactment of this approach during hearings on the Committee's proposals early next year. NSPE will, however, urge that the Moss-Gubser bill be amended to restrict the separate schedule to engineering, physical science and mathematics positions, plus the inclusion of a provision requiring either a degree or registration for engineering employees appointed or transferred to the separate schedule after a specified future date.

Johnson urged professional engineering societies to continue to work to raise Federally-employed engineers and scientists to their former level of prestige and to keep informed on pending legislation so that they will be in a position to act for the benefit of the profession.

AE Meetings of Note

American Institute of Chemical Engineers—Annual Meeting, December 6-9, Sheraton-Palace Hotel, San Francisco, California.

American Society of Agricultural Engineers—Winter Meeting, December 16-18, Palmer House, Chicago, Illinois.

American Association for the Advancement of Science—Annual Meeting, December 26-31, Hotel Morrison, Chicago, Illinois.

BLS Survey to Include White Collar Pay Data

The Bureau of Labor Statistics has recently announced an expansion in its community wage surveys to include nationwide data on white collar pay in private industry. The information collected will permit annual estimates of the rates paid in private employment for work similar to that performed by Federal classified employees.

The fields of professional and managerial work surveyed will include engineering, accounting, legal, physical sciences, mathematics and others. Professional and managerial pay data will be collected from 2,100 establishments selected from manufacturing; transportation, communication and other public utilities; trade; finance and insurance, and engineering and architectural services.

The primary purpose of this survey is to accumulate information and dependable data which could form the basis for adjusting Federal pay to prevailing rates in private enterprise. The President has stated several times that Federal pay should be reasonably comparable with non-Federal pay for similar work, and members of Congress and Congressional committees have, in their deliberations on Federal pay, evinced interest in prevailing rates in private employment.

In addition to reporting on pay rates, the BLS survey will cover pay distinctions among engineers, entrance rate policy and nonproduction bonuses. The first annual report, covering surveys made between July 1, 1959, and June 30, 1960, is to be published in December, 1960.

Wilkens Appointed

Henry Wilkens, Jr., municipal utility specialists with the Houston, Tex., firm of Turner and Collie, Consulting Engineers, Inc., has been appointed a member of the National Defense Executive Reserve, the U.S. Department of Commerce has announced.

Registration for Engineers Urged by Underwriters' Labs

Underwriters' Laboratories, which issues the "UL" tag that appears on electrical appliances, has moved into vigorous support of engineering professionalism through registration and society membership.

In a memorandum to the staff of the Laboratories' engineers, UL President Brandon urged registration and affiliation with professional societies. Promotion to a supervisory position may be jeopardized if the engineer has not accomplished registration, he indicated. Approximately one-third of the present engineering staff have obtained registration and a substantial number of staff engineers are preparing for the examinations. The full UL statement follows:

"Inasmuch as our organization is primarily an engineering organization, it is incumbent on our engineering staff to advance both their professional knowledge and their professional status in every proper manner, and one of the most important steps in this direction is qualifying under existing laws as a Professional Engineer.

"Professional Engineer registration is covered by law in every State, and it is becoming more and more necessary to have such recognition in order to qualify as a professional man. In addition, all of us have an obligation to support efforts to clarify the status of engineers for the protection that affords the public.

"We also have an obligation to affiliate with one of the professional societies, both for the support we can give their objectives and for the education which such affiliation provides.

"In our operations it will be essential in the future to consider professional status in connection with any supervisory engineering job, and that is one reason this situation is called to your attention."

NSPE to Urge Amendment Requesting Registration

When Congress convenes early next January, NSPE will again urge an amendment to a pending bill introduced by Senator Hubert H. Humphrey which would create a new Federal Safety Division in the Department of Labor to direct and coordinate all Federal safety educational programs.

The Humphrey bill provides for the appointment of at least ten "qualified safety engineers" to the new Safety Division. NSPE will seek to have the language amended by adding a requirement that the safety engineers appointed be registered under applicable state engineering registration laws. NSPE will point out that there is no better indication of professional qualification and competence than registration as a professional engineer.

A similar bill had been introduced by the Senator during the last Congress. Although reported out by the Government Operations Committee, the bill failed to come up for Senate floor debate. At that time NSPE also suggested that a registration requirement be incorporated into the bill, and received assurances from the Senator that he would seek to have it appropriately amended when and if the bill were debated in the Senate. The new bill, however, does not contain the language that NSPE suggested and to which the Senator seemed favorably inclined (S. 2678).

"I have a feeling that new man will make good."

Material Sent on Refresher Courses

Material on registration refresher courses has recently been sent by the National Society to all presidents of NSPE state societies and chapters.

Designed to give assistance to these groups in arranging or sponsoring refresher courses for engineering registration, the material consisted of information on a Corps of Engineer refresher course at Fort Belvoir, Va., and also a bibliography on professional engineers' examination questions.

Display P.E. License Says Bur. Public Roads

The Bureau of Public Roads has requested its registered professional engineers to display their professional license. "In this way, visitors to our offices can be made aware of the professional stature of the staff," an interoffice memorandum advised the engineers. The Bureau encourages its engineers to become registered "and to display with pride the certificates which they receive for this accomplishment."

Bureau action followed a suggestion of an employee, referring to placing the organization on a par with private ones in the eyes of the employees and the public. The Bureau's official approval added that the program will enhance the prestige of the organization and its program administration.

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About This Series . . .

THIS month the AMERICAN ENGINEER begins the first of a two-part pro and con series on advantages of employment in a smaller company versus the advantages of large industry. In this issue Wayne E. Ault, P. E., who has been recently promoted to manager of engineering for the "Automatic" Sprinkler Corporation of America at Youngstown, Ohio, explains "Why I Like Working for A Smaller Company." Next month, an engineer from a large industry will counter with arguments on "Why I Like Working for A Larger Company."

Mr. Ault

Mr. Ault, who holds a Bachelor of Science degree in electrical engineering and fire protection engineering from the Illinois Institute of Technology, is a former chairman of NSPE's Engineer in Industry Subcommittee. Before joining "Automatic" Sprinkler Corporation in 1946, he was with the Naval Research Laboratory in Washington, D. C.

His company, "Automatic" Sprinkler Corporation, designs, manufactures and installs automatic fire protection equipment throughout the world. Its operations include carbon dioxide, dry chemical, foam and water spray equipment. It has about 1,100 employees in its U. S. divisions including thirty engineers.

WHY I LIKE WORKING FOR A SMALLER COMPANY

By

WAYNE E. AULT, P.E.

Manager of Engineering, "Automatic" Sprinkler Corporation

Is bigness synonymous with success for the engineer in industry?

A glance at some of the "Engineers Wanted" advertisements in American newspapers might lead one to assume this was truly the case. However, despite the obvious appeal of some of these glamorized advertisements, many of the country's top engineers are passing the industrial giants by to find their opportunities with less publicized small and medium size engineering staffs.

Are these engineers getting the same breaks as their fellow professionals who join the big multi-division staffs of larger industry? Judging from my own experience, I must answer with a resounding yes.

Fourteen years ago, I decided to hitch my star to one of these so-called smaller companies. I certainly have not regretted the decision. In fact, I think this size organization has given me many advantages and opportunities which I might have missed in a larger company.

Of course, I don't think it is possible to make a flat statement that a smaller organization is automatically better for the engineer, any more than it would be valid to claim that the large companies offer all the important advantages. Naturally the question is one which must be decided by the individual engineer taking into account his personal likes and dislikes. Nonetheless, it is obvious that a smaller company must utilize its engineering personnel differently from that of a huge industrial enterprise. Many of these differences, I am convinced, boil down to real advantages for the engineer in smaller industry.

Actually, when I came to work for "Automatic" Sprinkler Corporation of America, I did not consider, at least to any great extent, the question of "big versus small" organizations. I made my decision to join the company primarily because I felt it was a sound organi-

"Automatic" Sprinkler Corporation of America located at Youngstown, Ohio, is the 'smaller company' about which our author writes. The company designs, manufactures and installs fire protection equipment throughout the world. The author, Wayne E. Ault, P. E., has been with the corporation since 1946 and is now manager of engineering.

zation which was a leader in its field.

Looking back, however, I realize that a great many of the things I have been able to do and a great many of the satisfactions I have enjoyed were possible only in the intimate closely knit type of atmosphere which prevails in smaller companies.

I was greatly impressed with the intimacy and informality of the whole organization the first time I stepped in the door at "Automatic" Sprinkler. While many of the larger companies go in for a big splash in recruiting and pre-hiring interviews, this company took what I considered to be a very practical down-to-earth approach. I was interviewed by the man for whom I was to work, and was told, insofar as was possible, the exact duties and relationships which I could expect to find on the job. And on this first trip, I met the president of the corporation and practically all of the officers in a matter of a few minutes. This type of intimacy between the engineer and the top level of management is seldom possible in the big companies.

I also believe that many of the advertisements of the large companies, as impressive as they are, leave engineers a little cold. At least I know it is hard for me to see through many of the advertisements and envision just exactly what a new employee will be doing. I think you know very definitely when you come to work for a small company exactly what you are going to do and how your job will relate to the other operations of the company.

THIS, I am convinced, is a major plus factor on the side of the smaller company. But, even more important is the fact that this close intimacy continues over into the day to day operations of a smaller company. At "Automatic" Sprinkler, and I imagine this is true of nearly all companies of this size, we have what might be called an "open door" policy at all levels. If we deem it necessary it's possible for us to carry our problems before the president, the executive vice president, department heads, or anyone else without great difficulty. Of course, we use the privilege with discretion, but nevertheless we know the doors are open. Such informality is virtually impossible in a large company.

Intimacy in a smaller company is more than just being able to say "Hello, Bob, and Hello, Ed," when you walk in each morning. It has real meaning in the everyday functioning and operation of the plant. In this size plant, problems don't have to wait for formal meetings; instead they are often met headon

The Team Working Together . . .

Everything from design to inspection of the finished product comes under the duties of an engineer in a smaller plant. Here Mr. Ault inspects a group of sprinkler heads which have just come off the production line.

in a man to man firsthand contact between the personnel concerned. And this intimacy or informality, which runs both horizontally and vertically, has big advantages for the engineer in his job performance, satisfactions and in his opportunities to learn and understand the total problem of getting the company's job done successfully. It's a feeling which simply cannot be duplicated in a multi-division company whose functions may be scattered over several states.

I think it is particularly true that you learn other people's points of view much faster in a smaller company than would be possible in a bigger operation. We don't make decisions in any department (and this is probably true of big companies, too) without making sure that we are satisfying interests of other departments. But, unlike large companies, this interchange of departmental viewpoints is accomplished often on a man to man basis. The same man who contacts Department A today will probably windup talking to Department B on another subject tomorrow. So, we are constantly in contact with one another and in this atmosphere it doesn't take long to catch on to the problems of the total operation. In addition to these numerous informal contacts, we also have what is known as an Interdepartmental Committee which meets once a month and the job of this Committee is exactly as the name sounds – to talk over the problems of the various departments to find out which department might best solve the problems which have come up over the past month.

If it's a developmental problem, then it's our responsibility in the Technical Department. It may be sales, production or shipping, but whatever the problem all of us get an excellent opportunity to learn the viewpoints of other departments. We also have a weekly staff meeting to discuss business in general. This gives us an opportunity to see the financial and administrative side of the business firsthand and to learn the problems of our salesmen, purchasing agents, credit managers, production people and others.

In general, the engineer has an outstanding opportunity in the smaller companies to learn about and to participate in administration. Actually it's difficult to avoid moving into administrative fields in a company of this size because there are essentially just as many areas of activity in a small company as there are in a large company, but there are fewer people and fewer departments to administer these areas.

This situation gives the individual an opportunity to accept more responsibility and to have broader interests, some of which require him to move into areas normally associated with administration. It seems in a small company that the administrator can hardly avoid becoming familiar with engineering and the engineer can't help but find himself dealing with administrative functions.

Administrative training of the engineer and other personnel is by no means left solely to chance in a smaller organization. At "Automatic" Sprinkler I think the management makes a very conscious effort to train and interest its engineering personnel in administration. We had an excellent example of this only last month when the company sponsored an experimental five-night "management game." Personnel from all departments were divided into four-man teams, given a fictitious company with fictitious costs, a fictitious production capacity, and a fictitious reserve and so forth. For five nights we played out this hypothetical situation in competition with other teams, delving into all phases of operations which would be faced in an actual company—prices, pro-

Closeness of Communications . . .

Administrative Responsibility . . .

Frequent Exchange Of Ideas . . .

duction levels, advertising, sales problems, and research and development. We not only got a great deal of fun out of the game, but picked up new understanding of the complexities of running a company in a highly competitive market.

Administrative development is just one facet of the diversification of duties and opportunities which the engineer in the smaller company lives with daily. I firmly believe that the engineer who wants diverse responsibility and lots of diverse experience can find a lot of satisfaction in a smaller company.

There are a number of ways an engineer can be satisfied in his job. Some prefer being specialists. I have a friend who is a corrosion specialist with a large chemical firm, and his job seems to give him a great deal of satisfaction. He has specialized so thoroughly in his particular field that it has really become tremendously interesting to him. A company of this size might conceivably have a few specialists, but we couldn't afford to keep too many on the pay roll simply because they wouldn't have enough work to keep them busy. So diversification becomes a necessity; a highly interesting necessity for the engineer.

Certainly it's far from a boring existence. In a plant of this size you might be busy one day with a problem brought to you by a plant inspector while the next day you might be concerned with the design and development of a new product; and another day you might find yourself busy with a salesman in the field who needs technical help in selling a certain idea.

Designing, experimental development, tooling, production drawings, testing, quality control, maintenance of standards . . . these are all areas in which our department will become involved at one time or another. This type of diversified operation makes it very necessary for us to perform as a closely-knit team. As part of this team operation we get together periodically to talk over our various projects and to review each man's contribution and progress. Actually in a smaller company these meetings need not be held too frequently since much of the progress can be reviewed simply by taking a short walk through the department.

THE engineer in a smaller company derives a great deal of satisfaction from the fact that he can watch the day by day progress of his ideas being put into action. In a company of this size, the man who does the original work on a project has a chance to see how it works, why it works, or why it doesn't work and what he might have to do to make is a better design. Each step of the process of putting the idea into workable form may be only a few yards away. So he has the satisfaction of watching and participating in this daily development and of learning exactly how his individual contribution fits into the total scheme of the company.

On the other hand, the engineer who specializes in a larger company may see only his little phase of the over-all project. In the big company a set of drawings may wind up in another shop or in another part of the plant located miles away and the engineer may never know the total fruits of his work unless there is something drastically wrong.

Recognition for the engineers' contribution has become firmly implanted in the policies of both large and small companies, but I believe some of the smaller companies often have a better opportunity to give the engineer a more meaningful form of recognition. In a large company, the matter of recognition is too often relegated simply to dollar and cents and a letter of commendation. Although these are nice, I think it may be more meaningful for an individual to receive a pat on the back from the president or the vice president of the corporation once in a while. It's a direct, personal recognition that is usually only possible in the smaller organization.

This direct form of recognition may also have a bearing on the engineer's chances for promotion in a smaller company. As I have already pointed out, the engineer in a smaller organization has more decisions to make and oftentimes a broader field in which to try out his ideas. These factors undoubtedly aid in the chances for promotion. However, I don't believe when you join a smaller company that there is any guarantee that you're going to become president of the company, chief engineer or to progress because I believe it all rests on ability. And ability in a small company is no different from ability in a large organization.

I think smaller companies also have a good record of encouraging the educational and professional development of its engineers. The company here will pay fifty per cent of the tuition of any course which develops the individual in connection with his duties at "Automatic" Sprinkler. And in general the company encourages its employees to complete and continue their education and training. In fact, at the present time four members of our department are attending Youngstown University.

It's not all work in a smaller company. Here, Mr. Ault tallies up his score in a 'management game' which was recently conducted at the "Automatic" Sprinkler Corporation. Personnel of the company were divided into teams to compete against each other in the operation of fictitious industrial concerns.

AUTOMATIC Sprinkler also takes an active interest in encouraging its personnel to participate in professional and technical societies. Company policies provide for three different types of participation in

(Continued on page 39)

FROM WASHINGTON

BY
MILTON F. LUNCH,
N.S.P.E.'s Legislative Counsel

THE TECHNICIAN PROBLEM

THERE is widespread and general agreement on the part of national leaders, both in government and in the engineering and scientific professions, about the present and future importance of engineering and scientific technicians in meeting the technological challenge. This accord of thinking embraces the concept of technicians in a vital supporting role to professionals in the ratio of between 3-6 to one professional, depending on the type of activity involved. And there is little doubt that a great deal must be done to stimulate and provide these technicians without delay.

◄ Senator Bush

These reasons accounted for the inclusion of Title VIII in the National Defense Education Act of 1958—providing a program to extend the concept of Federal assistance for vocational education, which has a long and successful history, to the new area of technicians "in scientific or technical fields." The administration of Title VIII was assigned to the Division of Vocational Education of the Office of Education and that office has been making a valiant effort for a little more than a year to handle the broadened concept of technician training, as stipulated by Congress.

One of the obvious difficulties, and one which NSPE called to the attention of Congress when the law was being debated, is in having the same organization, and largely the same people, experienced in vocational education for many years recognize the essential differences inherent in the type of high-level engineering and scientific technician training which the law requires. Another major difficulty lies in the Congressional policy determination that the technician program should operate at "less-than-college-grade," through the public school system, as has been the rule for vocational education.

To evaluate the progress and problems to date, the office of Education invited representatives of professional engineering and scientific bodies to an informal meeting and presented a comprehensive run-down of the current status of the program, with the Society representatives free to ask challenging questions and make suggestions. Some of the major points of information gleaned from that meeting were:

Wayne O. Reed ►

• Of twenty-nine states reporting, there were 291 preparatory programs and 346 extension courses in operation during the 1959 fiscal year.

• Two-thirds of the students are high school graduates.

• The various courses are offered in technical high schools (29 per cent), vocational high schools, (34 per cent), comprehensive high schools, (11 per cent), community or junior colleges, (36 per cent), and four-year colleges, (3 per cent).

• As of June 30, 1959, out of a total enrollment of 38,000 in forty-one states, 14,000 were preparatory students, which is defined as a rigorous-type 2-year program, and 24,000 are extension students, taking short-term courses of six months or less, mostly of a part-time nature.

The Office of Education spokesmen emphasized that the program is administered and operated by the **states** and that the Federal officials cannot readily dictate or require the content or nature of the courses. Rather, the Division of Vocational Education is relying heavily upon "suggestions" to the states. The suggestions concerning the characteristics of training programs seem to be in full accord with the Congressional

and professional society concepts of high-level technician training. Nevertheless, there remains serious question whether the program is going to produce that type of trained technician in the light of the course enrollment and administration given above, with heavy emphasis on the role of the high schools.

Among those at the conference were Karl O. Werwath, president, Milwaukee School of Engineering, and H. Russell Beatty, president, Wentworth Institute, Boston. Both schools are accredited technical institutes which offer a high-level concentrated two-year program. The Werwath-Beatty comments emphasized this fundamental difference—the attempt to provide highly-trained engineering and scientific technicians through what is essentially an extended high school program, versus training in the college-level type of institution. The difference is more than one of degree. At the risk of some over-simplification, the discussion disclosed that the difference is one of upgraded craftsmen with some additional knowledge of mathematics and science, compared to those who have received a rather detailed and general technical education and who can operate in the design area, applying the known engineering and scientific principles originally developed and proved by the professional group.

◄ Karl O. Werwath

H. Russell Beatty ►

Two recent articles from quite different types of publications further illustrate the problem. **Business Week** reported in some detail in the November 7th issue on the technician program under the Federal law as seen at the Division Avenue High School, Levittown, N.Y. The clear implication of the report is that the high school program is turning out engineering and scientific technicians, as Congress contemplated. The Levittown program largely embraces high school students who stand high in the IQ ratings. Is this type of advanced high school training that which Congress had in mind in imposing the tighter language to train people for occupations "requiring scientific or technical knowledge?"

The second article is from **The International Operating Engineer** (AFL-CIO) and reports on a resolution adopted by the Metal Trades Department of the AFL-CIO on the "technician's problem" under the National Defense Education Act. The background of the resolution was an attempt by the union groups last summer to tie a rider to an appropriation bill so the Federal "technician" funds would also be available for instruction of apprentices. Senator Prescott Bush of Connecticut, original author of the language tying the program to scientific-type knowledge, was able to kill the rider on the point of order that it was legislation on an appropriation bill. The current Metal Trades resolution asks amendment of the law for the same purpose. Also, the union representatives have allied themselves with the American Vocational Association to seek an advisory committee to meet with the Office of Education on administration of the technician program.

In the light of these conflicting pressures, the picture now would seem to be (1) a desire to channel the program into very high-type technician training of two years or more through collegiate level schools, (2) an attempt to reduce the program into a mere continuation of the vocational training programs of the past, and (3) the difficult task of the Office of Education in walking the tightrope between the two.

It seems clear that in plowing its new ground Congress did not plow a straight furrow, or deeply enough to establish a sturdy program structure. This may be explained, in part at least, by the fact that there were (and are) few clear guidelines to establish the lines of demarcation between craftsmen, engineering technicians and engineers and scientists. Beatty and Werwath expressed a deep concern at the conference over the question of the very survival of the high-level accredited technical institutes if young men and women can attend short-term public school courses and be identified in the public and industrial mind as "technicians." If that pattern prevails, they warned, the accredited technical institutes will have no choice but to convert into full-scale four year engineering schools, leaving the two-year technical institute-type education high and dry at a time when it is the most pressing need in the technological manpower area.

Deputy Commissioner of Education Wayne O. Reed placed the problem in its proper perspective in pointing out that the National Defense Education Act is a 4-year experiment which Congress will reconsider within the next two years. The present lack of clarity over "technician" can really be resolved only by Congressional action insofar as it relates to the national program. The next two years, therefore, should be used by the professional societies and others to arrive, if possible, at some agreement on a **specific** definition and type of program which will provide the country with its all-important "second line" of technological manpower defense. The NSPE Engineering Technician Committee is already deeply into such studies. This area of study, however, needs to be supplemented by a determination of whether there is a need for a federal technician program and, if so, its composition, content, and source of instruction.

THE ANATOMY OF EXECUTIVE LEADERSHIP

By

MELFORD E. MONSEES, P.E.

Chief, Program Development Branch, Engineering Division, U. S. Army Engineering District, Kansas City, Mo.

IT is difficult to define *executive leadership* and to delineate the functions and duties of any one executive. It is first necessary to determine what is meant by the term executive, the relationship to leadership and the characteristics, duties, requirements, and functions of leaders and executives in general.

Leadership has received considerable attention in recent years by various writers and management groups. Consequently, there have been similarities as well as differences among writers relative to definition of the terms and delineation of functions and duties.

Leadership is a term sometimes used in describing executive performance. On occasions it has been described as a trait that some possess and others do not. There is often debate as to whether it is something inherited or something which is acquired by experience and training. Carroll L. Shartle[1] stated "executive performance that influences others would be leadership performance. More specifically it would be acts which influence the acts of others."

An executive is defined by Richard H. Harris[2] as one who coordinates and supervises the factors, some human, which are necessary to the achievement of an objective which he thoroughly understands.

[1] Shartle, Carroll L.; *Executive Performance and Leadership* (Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1956), p. 105.
[2] Harris, Richard H., *Executive Development Program*, Thesis, 1949, M.I.T., M.S., School of Industrial Management.

In the book *Group Approach To Leadership—Testing*, Henry Harris stated "Leadership is the measure and degree of an individual's ability to influence and be influenced by a group in the implementation of a common task. This circumscribes three important aspects of leadership function: The individual, the group and the task; and indicates leadership as a functional relationship between these three basic variables."[3]

Chester I. Barnard indicated that executive functions "serve to maintain a system of cooperative effort," and that (executive work is not of the organization but the specialized work of maintaining the organization in operation)."[4]

[3] Harris, Henry, *The Group Approach To Leadership—Testing* (Rutledge & Kegan Paul Limited, London, 1949), p. 19.

The good executive must initiate studies, research, and projects, says the author.

Organic Functions of Executives

There are three organic functions of executive work according to Ralph Currier Davis[5] which are: planning, organizing, and controlling. *Planning* involves "the determination of what is to be done, how and where it is to be done, and who shall be responsible." *Organization* is "the process of creating and maintaining the requisite conditions for the effective and economical execution of plans." *Control* is defined as "the regulation of the activities of the organization."

A workshop[6] conducted by Columbia University developed the following as general functions of the executive:

a. *Initiating*—Studies, programs, policies, research, systems, facilities, projects, etc.

b. *Planning* — Developments, operations, maintenance, construction, safety, training, budgets, programs, etc.

c. *Deciding*—Policies, problems,

[4] Barnard, Chester I., *The Function Of The Executive* (Harvard University Press, Cambridge, Massachusetts, 1951), pp. 215-234.
[5] Davis, Ralph Currier, *Industrial Organization And Management* (Harper and Brothers, New York, 1949), pp. 35-36.
[6] Columbia University, School of Engineering, Department of Industrial and Management Engineering, *Proceedings of 3rd Utility Management Workshop*, May 16-26, 1954 (New York, 1955), p. 26.

organization, personnel, financial, etc.

d. *Executing*—Contracts, agreements, directives, instructions, plans, programs, etc.

e. *Organizing*—Personnel, staff alignment, departments, divisions, field offices, etc.

f. *Delegating* — Responsibility, authority, assignments.

g. *Supervising* — Personnel on studies, research, planning, design, budgeting, programming, construction, maintenance and operation.

h. *Controlling* — Personnel, equipment, expenditures, schedules, and in general.

i. *Working*—On and with civic committees, and educational, religious and charitable groups; public relations activities and professional societies.

j. *Studying*—All phases of engineering; new methods of design; construction and operations; trends in industry, economy, politics and development; financial outlook, personnel and public relations.

Executive Personality

Professional engineers encounter many problems that test severely the canons of engineering ethics. As he progresses upward in the organization jealousies will harass him. It is necessary that he rise above this sort of thing. It is a test of his bigness. He must have the ability to get along with people, think creatively and overcome inertia.

An executive should maintain an outward manner of calm simplicity, avoid the pontifical, be pleasant and make every effort to be friendly and democratic. He should analyze the problem and determine matters which require immediate attention. The decisive man anticipates as many of the common emergencies of life as possible. He is motivated by a personal idea of decisiveness, makes decisions promptly, improves and streamlines operations and implements plans of action.

Howard Smith[7] stated "An executive personality is a personality of leadership, flowing out of a rich and sympathetic understanding of human nature." The engineers who know how to get along effectively with others are relatively few in number. Human engineering is an important and highly specialized field. One engineer stated that he was in the business of engineering thirty years before he began to discover that people are more important than things. Mr. Smith stated that the dominant urge of a good executive must be (1) to deal with his fellow men on the same basis of concern for their welfare as well as his own, and (2) to climb to leadership through demonstrated work and with the approval and respect of his fellows.

[7] Smith, Howard, *Developing Your Executive Ability* (McGraw-Hill Book Company, New York, 1956), pp. 13, 15 and 27.

The executive must have sympathetic understanding of human nature. Here Robert W. Stieg (right), chief engineer of the Four Wheel Drive Auto Company at Clintonville, Wis., talks with German mechanical engineering student, Ernst Wilhelm Schiffer, who is gaining truck design know-how at FWD under the International Association for the Exchange of Students for Technical Experience (IAESTE) program.

In the development of young engineers into leaders and executives, the importance cannot be overstressed of the systematic exploration of leadership behavior and of the study of facts bearing on the aspects of the leadership phenomenon.

Carroll L. Shartle[8] stated "An executive is observed day in and day out by many persons. He is seen by his staff and by his supervisors. Persons in the community observe him. If he is in a position in which there is public interest, he is observed by many.

"The foregoing variety of impressions are those which are primarily related to the executive as a person, and they may be quite different from those evaluations concerned with what he does for the organization. However, it seems that being accepted as a person is often important if the executive is going to have the influence that is necessary in his position of high leadership potential."

Executive Influence

The executive influence is felt in many activities. Fourteen of the activities, which have been suggested by Mr. Shartle, are briefly as follows:

a. *Inspection of the Organization*—Direct observations, and personal inspection of services, installations, buildings, equipment, facilities, operations, or personnel for the purpose of determining conditions and keeping informed.

b. *Investigation and Research*—Acts involving the accumulation and preparation of information and data.

c. *Planning*—Preparation of and making of decisions which affect the aims of the organization as to

[8] Shartle, Carroll L., *Executive Performance And Leadership*, (Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1956), p. 130.

volume or quality of service or business (including thinking, reflection, and reading, and consultations and conferences with persons relative to short and long-range plans).

d. *Preparation of Procedures and Methods*—Acts involving the mapping of procedures and methods for putting new plans into effect, as well as devising new methods for the performance of operations under existing plans.

e. *Coordination*—Acts and decisions designed to integrate and coordinate the activities of units within the organization or of persons within units to achieve maximal over-all efficiency, economy, and control of operations.

f. *Evaluation*—Acts involving the consideration and evaluation of reports, policies, standards, programs, goals and results.

g. *Interpretation of Plans and Procedures*—Acts involving the interpretation and clarification for assistants and other staff personnel of directives, regulations, practices, and procedures.

h. *Supervision of Technical Operations*—Acts involving the direct supervision of personnel in the performance of engineering and related professional duties.

i. *Personnel Activities*—Acts involving the selection, training, evaluation, motivation, or disciplining of individuals, as well as acts designed to affect the morals, motivation, loyalty, or harmonious cooperation of personnel.

j. *Public Relations*—Acts designed to inform outside persons regarding the program and functions of the organization, to obtain information regarding public sentiment, or to create a favorable attitude toward the organization.

k. *Professional Consultation*—Professional advice and specialized assistance on problems of a specific or technical nature to persons within and outside the organization (other than technical supervision and guidance of own staff personnel).

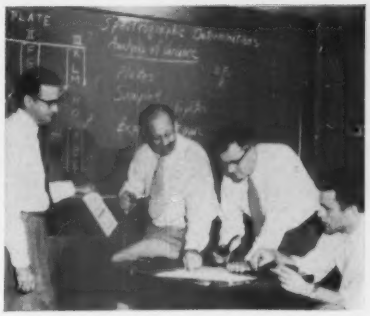
l. *Negotiations*—Acts involving negotiations, contracts, agreements, compacts, claims, etc.

m. *Programming, Scheduling and Dispatching*—Acts dealing with determination of time, place and sequence of operations.

n. *Technical and Professional Operations*—Performance of duties specific to a specialized profession (e.g., practice of engineering).

The executive must be responsible for mapping out new procedures and methods. Shown above are members of the General Motors' engineering staff at the GM Technical Center testing turbojet engine burners.

THERE probably are many more related activities, others than those listed above, in which the executive's influence is felt. Also some of the above activities may not apply to executive engineers on highly technical work. However, Carroll L. Shartle[9] stated "It is surprising to discover how many executives, particularly those high in the organization, perform these duties."



The successful administrator seeks expert consultation whenever it is necessary to do the job.

Basic Requirements

How do these duties, functions, activities, and characteristics of leaders and executives apply to the professional engineer, or more specifically to the young engineer with leadership and executive potentialities? It is felt that although individuals differ and executive and leadership qualities vary somewhat, there are certain basic requirements which might be considered as essential for all young engineers to possess in order to become capable executives in the engineering and construction fields. These basic requirements are as follows (suggested by William B. Given, Jr.[10]):

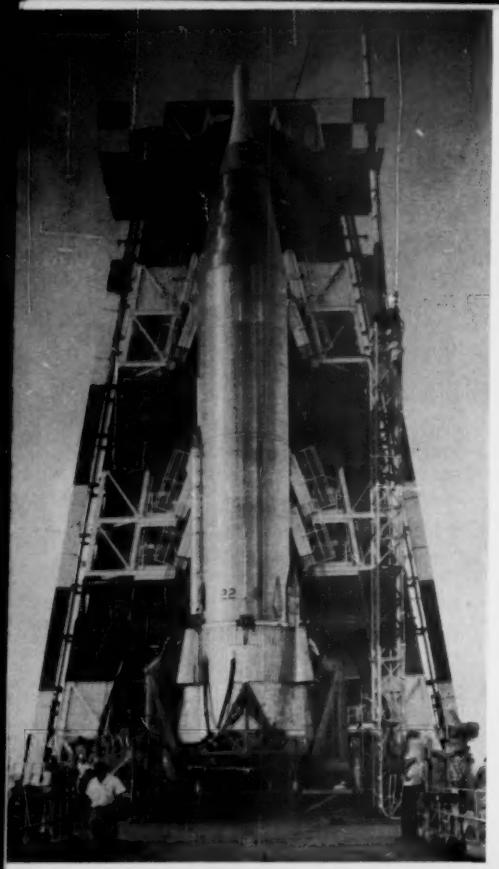
a. *Structural Visualization*—Understanding of spatial relations, ability to think in three dimensions, handling of shapes, forms, etc., is an innate characteristic. Visualization of ideas and plans of structures as they would look when completed.

b. *Imagination* – The quality that tends to lead from simple ideas to important technical developments and engineering accomplishments.

(Continued on page 40)

[9] Shartle, Carroll L., *Executive Performance of Leadership* (Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1956), p. 85.

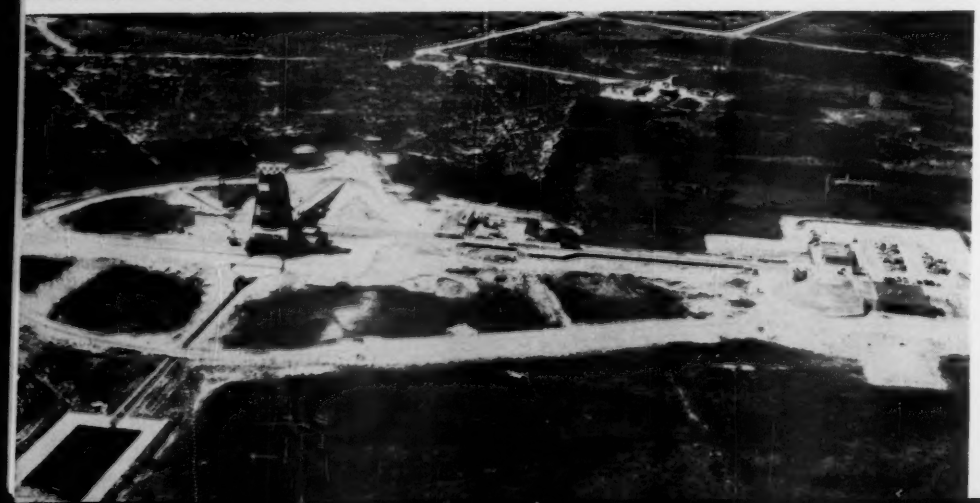
[10] Given, William B., Jr., *Qualities of a Good Engineer Evaluated as Management Qualities* (*Harvard Business Review*, January-February, 1955), p. 50.



Top left: Spaceport construction at the Cape includes the 10-story towers used in erecting and readying the Atlas ICBM. The towers are rolled away from the launching pad on steel rails just prior to a missile firing.

Middle: Port Canaveral on the Banana River. The pier for the Navy's Polaris program is at left center.

Bottom: An air view of an Atlas missile complex shows the ground support elements needed for an ICBM or space probe launching at the Cape. Lower left, a concrete evaporation pool to which missile fuels are pumped in case of emergency; left center, the launching pad and service tower; just to the right, a fuel and compressed gas pumping and storage area; far right, the blockhouse from which the missile is actually fired.



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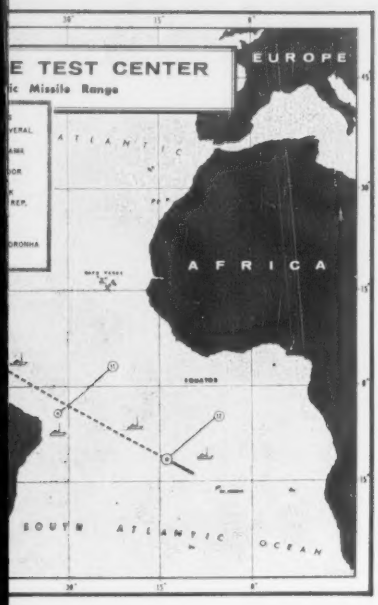
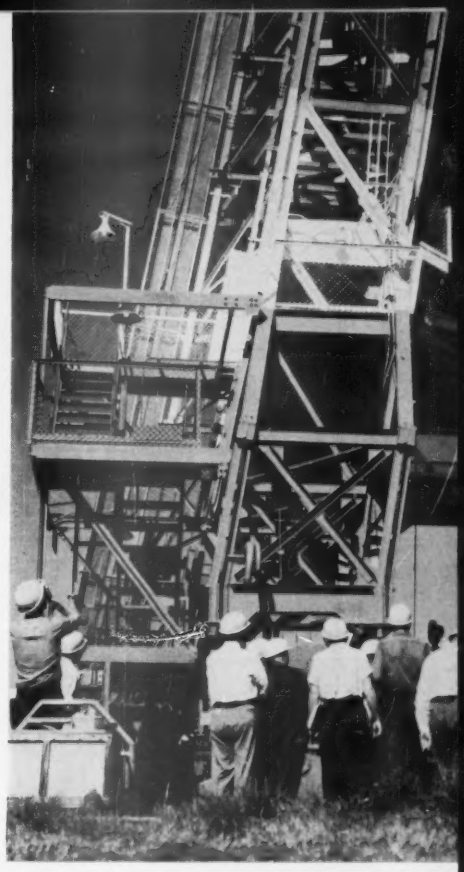
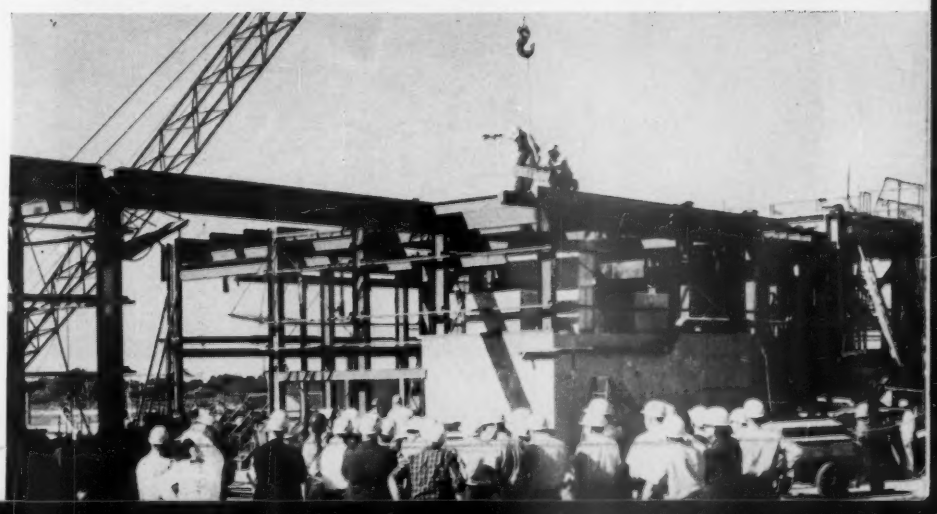


Top right: Engineering editors get a close-up of the 10-story service gantry for the Atlas missile. John T. Kane, of the AMERICAN ENGINEER staff, is shown at the extreme left.

Middle: Construction at Cape Canaveral includes the rebuilding of launching facilities destroyed or damaged when missiles or space probe boosters explode on the ground. Shown here is an assortment of wreckage taken from an Atlas launching pad after one of the big ICBM's recently blew up and burned on the pad. The Atlas blockhouse is in the center background.

Bottom: A group of engineering publication editors view rebuilding activities at the Atlas launching pad which was heavily damaged by a missile explosion.





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ring at naveral

KANE
gineer Staff

l" described some 15,000 acres of to scrub and inhabited by a light- s. The diamondback rattlers are sing battle as the Cape is rapidly prime "spaceport" and major test ilitary space probes.

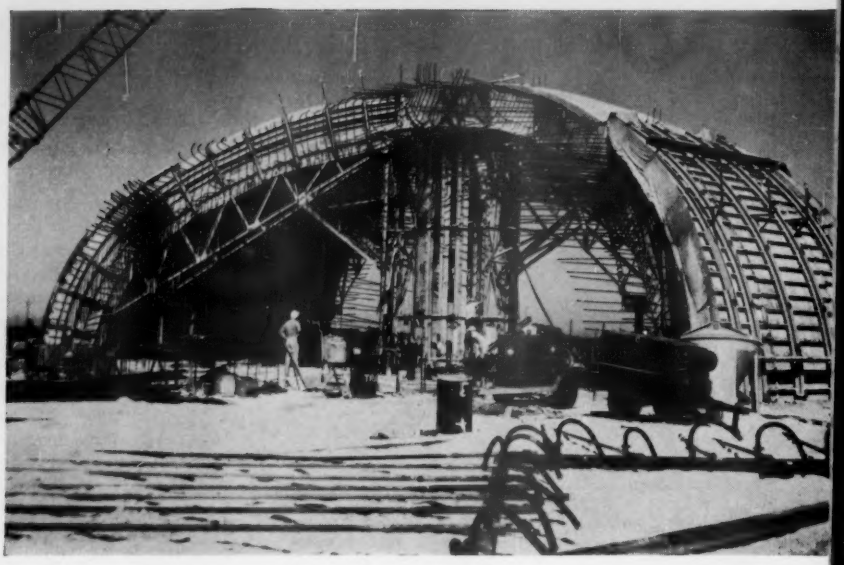
satellite launchings, moon probes, ballistic missiles has made Cape wspaper stories. But a tight net- tely shrouded the immense engi- or space-age ground support. To on some of this engineering ac- Force-sponsored tour of the highly Annex.

Patrick Air Force Base, which is ssile Test Center, and the Atlantic 000 miles into the South Atlantic. 18,000 military, civil service and about 1,200 temporary construc- employees work on the Cape.

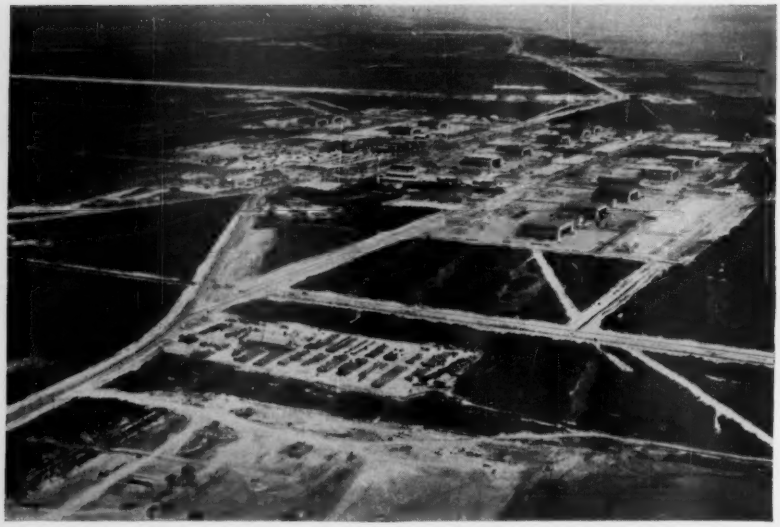
Canaveral is actually a vast indus- ng complex which is steadily in- ne missiles and space vehicles be-

come larger and more complicated. The various structures and installations on the Cape present a visual panorama of something that might best be described as an archeology of space technology—one can easily trace the growth in size and complexity from the first Vanguard launching areas to the enormity of the sites now being prepared for the Saturn with its 1½ million foot pounds of thrust.

Shown at the right are the first published photographs of construction work at the Cape Canaveral launching site for the 1½ million pound-thrust Saturn space booster. The photographs show structural work on the reinforced concrete blockhouse to be used in the firing of the giant space vehicle now under development by the National Aeronautics and Space Administration.



The engineering effort for ground support on the Cape has been primarily under the supervision of the Army's Corps of Engineers, in cooperation with the Air Force and civilian contractors. It has included a deep-water port, roads, missile assembly buildings, power generating facilities, a liquid oxygen plant, storage areas for exotic and extremely dangerous fuels and compressed gasses, a two-mile-long asphalt runway, launching pads for nearly all varieties of missiles and rockets, control block houses, a central control building, heavy reinforced concrete "silos" for the solid propellant missiles, radar sites, miles of underground cables, and a network of structures and equipment for the new AZUSA and other tracking systems.



Top: The 1½ million pound-thrust Saturn booster will be fired from this blockhouse under construction in the Cape Canaveral launching area.

Center: Construction workers install some of the piping needed for the Saturn blockhouse.

Left: Ground support industrial facilities on the Cape include a cement plant, lower left, a cable storage area, and shop areas for missile checking and final assembly.

The industrial area of the Cape is made up of nineteen large hangar-type buildings assigned to missile contractors, and a number of supporting shops and maintenance buildings. The missiles are taken directly to the former structures for component check out and final assembly before launching.

In the launching area, the 11-story gantry crane structures of the Atlas ICBM dominate the view along white sand beaches on the northeast rim of the Cape. Engineering design for these launching facilities must embrace erecting devices to stand the missile on end, fuel storage and pumping equipment, instrumentation, flame deflectors able to stand up under rocket launchings and static tests, air conditioning for electronic components, and a water deluge system able to pump 35,000 gallons per minute as a rocket flame coolant.

The blockhouse from which the Atlas is launched is about 750 feet from the launching pad. Nestling snugly under its dome consisting of ten feet of reinforced concrete and fifteen feet of packed sand, the blockhouse is designed to withstand a blast of 50,000 pounds of TNT at a distance of fifty feet. Inside the blockhouse are controls for launching, telemetry instrumentation, periscopes, television screens, and a long list of other equipment for missile testing activities.

Electricity for the multitude of instruments and circuits on the Cape runs up a monthly power bill in the neighborhood of $100,000. This commercially purchased power is supplemented with a generating facility in the Missile Text Annex which furnishes DC current for critical circuits as soon as a countdown begins for each missile.

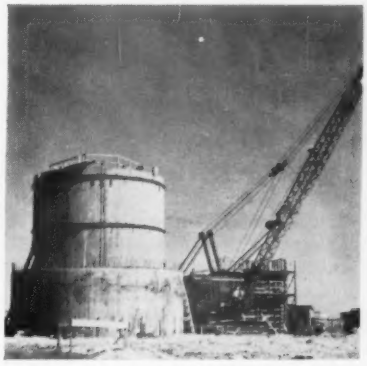
The nerve center for operations on the Cape and on the Atlantic Missile Range during a missile firing or space probe is the Central Control Building. Here, all the instrumentation and other essential preparations are coordinated, information on range clearance and safety established, and the final permission for the launch passed on to the firing crew in the blockhouse. After a launch, the people in the Central Control Building supervise the flight data collection activities. To analyze the data collected by missiles and satellites, a $7,000,000 technical laboratory has been constructed at Patrick Air Force Base. With a floor area of some 455,000 square feet, this building is one of the largest in Florida. Here the information obtained from the flight is fed through automatic reduction processes. The outcome of this is the flight test report.

Taken all in all, the Cape Canaveral spaceport is a dramatic illustration of the validity of the thesis that the road to outer space is paved with engineering achievements in all the specialized branches.—**End.**

Roaring flames from the Jupiter missile light up the Florida night as the "bird" lifts off its launching pad on the tip of Cape Canaveral.

Heavy excavation work goes on continually at Canaveral as the launching facilities for the larger rocket vehicles take shape.

New missiles such as the solid-propellant Minuteman require new engineering concepts in launching pad design. Here, a reinforced concrete base is being constructed at one of the solid-propellant launching sites.



Reinforced concrete "silos" for the solid-propellant Minuteman missile are changing the horizon at Canaveral.

New Literature

LIGHTING STANDARDS – A steel and aluminum lighting standards catalog has been released by the Kerrigan Iron Works, Inc. Described in the catalog are the various standards in the

Kerrigan line, using high strength low-alloy steel. The Kerrigan standard in 11-gauge low-alloy steel is more than equivalent of a 7-gauge mild steel standard, in resistance to bending and corrision, according to the manufacturer. The fully diagrammed publication is divided into a number of sections, each dealing with lighting in regard to streets and highways, floodlights, traffic signals, and other areas.

(Circle 16 in Readers' Service Dept.)

RAILING—A catalog featuring welded and fitted tubular railings has been published by Tubular Products, Inc. It provides basic engineering data and standards for railing design. A feature of the catalog includes a pictorial check of railing fittings which provides immediate identity and fast selection of fittings desired for any particular type of railing application. Another selection gives design details for welded and fitted railings in a complete form for incorporation in drawings and specifications. An entire spread is devoted to design check lists and basic data needed to specify any type railing installation. This sheet and other sections of the book contain detailed drawings of configurations of railing for many different applications with a complete list of standard nomenclature and standard sizes of fittings.

(Circle 17 in Readers' Service Dept.)

EQUIPMENT – Pacific Mercury has just issued a condensed 8-page version of its 1959-60 catalog of construction equipment. The catalog covers the company's complete line of electric plants; the Mobilite trailerized floodlighting unit that generates its own power; PM neon and incandescent flasher warning lights; street barricades, and "Solo" concrete portable vibrators. Also available now from Pacific Mercury is a complete list of the power requirements of mechanical equipment operated off electric plants to aid in the selection of generators with the proper power requirements.

(Circle 18 in Readers' Service Dept.)

COOLING TOWERS—Suggestions on the winter operation of outdoor cooling towers have been published by Water Service Laboratories, Inc., chemical engineers and corrosion prevention specialists. Following the steps outlined in this leaflet will help to avoid freeze-ups in cooling towers which must be operated in sub-freezing weather, it is claimed. The bulletin specifies the steps which can be taken to prevent freezing of parts of the system exposed to the cold air.

(Circle 19 in Readers' Service Dept.)

FLOODLIGHTING – Planning the lighting for parking areas, construction sites, shopping centers, farm yards, and other open areas can be made easier by using Crouse-Hinds new Bulletin 2719. Aptly titled *Area Floodlighting Made Easy!*, the 16-page booklet gives quick reference guides for selecting incandescent or mercury floodlights, general purpose or heavy duty types, and for determining how many floodlights are needed based on the size of the area to be lighted. Footcandle charts and installation diagrams are included, along with listings of floodlights and mounting accessories.

(Circle 20 in Readers' Service Dept.)

BLAST CLEANING—A new guide to pressure type abrasive blast cleaning operations, as well as a catalog of machines and accessories, has been released by the Sanstorm Manufacturing

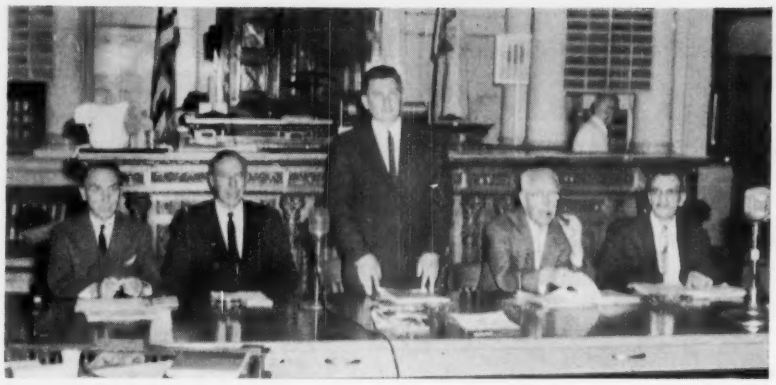
Company. The Sanstorm catalog #594 contains information on both open top and closed top pressure type sandblast machines; nozzles to be used in various operations; data tables on ratios of nozzle bore sizes to compressor capacities, and operator accessories. It also introduces data on the new Sanstorm high velocity blast nozzle which is claimed to multiply the surface area coverage that can be cleaned compared to ordinary nozzles and without equipment or abrasive alterations.

(Circle 21 in Readers' Service Dept.)

DISTRIBUTORS—Process Engineers, Inc., a division of The Eimco Corporation, has released a 16-page bulletin, #SM-1011, covering Eimco-Process rotary distributors. These self-propelled mechanisms are designed to provide uniform distribution of sewage or organic industrial wastes over the surface of a biological filter. Both standard rate and high rate types are described and details are given on the variety of center assembly, arm and special-feature components used in the design of a complete machine. The bulletin is printed in color and is illustrated with engineering drawings, installation photos and charts, and includes unusual single-stage and two-stage complete treatment flow sheets.

(Circle 22 in Readers' Service Dept.)

These listings are informational only and are not an endorsement of the products, nor of the manufacturer's claims. To receive any of the new literature described in this column, merely circle the item number in the Readers' Service Dept. and mail to AMERICAN ENGINEER.



The special board hearing the McCamy case in the Assembly chamber are, l. to r.: Louis Klauder, P. E., New Jersey SPE; Herbert Taylor, P. E., New Jersey Engineering Registration Board; Andrew Salvest, Deputy Attorney General, chairman; Alfred Green, New Jersey Society of Architects, and John Scacchetti, New Jersey Architects Registration Board.

Did P.E. Practice Architecture? —Question Before N.J. Board

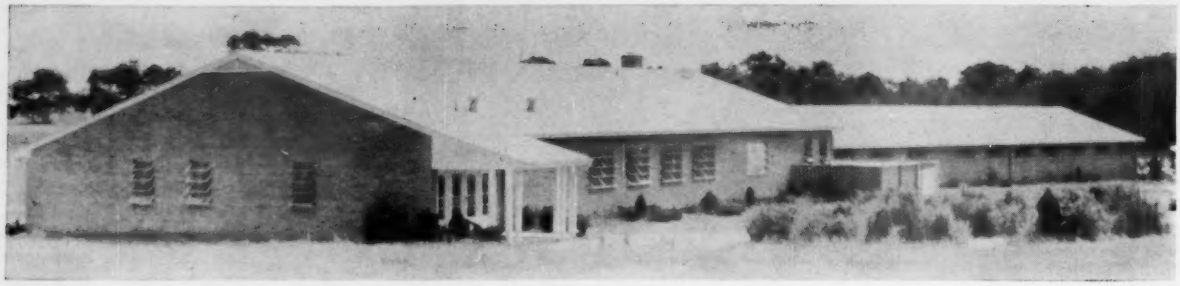
A REPRESENTATIVE and distinguished group of professional engineers and architects in New Jersey, and some from other parts of the nation, gathered in the Assembly Chamber of the historic State House in Trenton, New Jersey, recently to start a unique proceeding of nationwide interest. The reason for the gathering was simply to consider whether certain activities of a professional engineer were lawful—or whether he had acted illegally by practicing architecture without a state license to do so.

William J. McCamy, a New Jersey professional engineer designed a private residence and a country club golf house. The State Board of Architects, backed by the New Jersey Society of Architects, charged he had engaged in the practice of architecture. The New Jersey Society of Professional Engineers backed McCamy's position that he had engaged solely and exclusively in the practice of engineering in the two designs.

The current proceeding, which will apparently consume several months, is unique in such disputes because of a 1952 New Jersey law sponsored by the architects' and professional engineers' societies jointly and now being used for the first time. The 1952 law established a special board composed of one representative from each of the two professional societies, one representative from each of the two professional licensing boards, and the attorney-general or a deputy attorney-general. The function of the board is solely to determine whether there is a reasonable basis for a charge of illegal practice in either profession by a practitioner of the other professon. If the special board determines the question in the negative an action to recover a penalty cannot be instituted in the court. If the answer is in the affirmative the charges may be filed in court and the person charged is then given a further opportunity to defend his conduct as lawful.

THE McCamy case is somewhat unique for an additional reason; although there have been a substantial number of engineer-architect jurisdictional cases over the years, the contestants in New Jersey are approaching the issue on a broad range, dealing extensively with the history, traditions, laws and economics of the relationship between engineering and architecture. In the first day of the hearing, for example, Arthur W. Lewis, former state senator and attorney for the New Jersey Society of Professional Engineers, as a "friend of the board," led Leopold Arnaud, dean of architecture at Columbia University for twenty-five years, appearing as an expert witness for the architects, through a dazzling line of inquiry into the famous names of engineering and architecture as long ago as the Glory of Rome. Lewis was undertaking to show how architecture and engineering originally grew as one art and separated much later in history into the present conception of different professions.

In essence, the architects' case is that there are two distinct and different professions, that architecture requires different training and that there is no overlap between the two types of practice—each occupying a separate identifiable area. To support their argument, the architects rely heavily on a 1942 New Jersey decision (*Gionti v. Crown Motor Freight Co.*) that a licensed engineer was not entitled to recover for architectural services rendered where he did not also possess an architect's license. The court rejected the argument that



Shown are the private residence, left, and golf house, above, which were designed by Engineer McCamy.

since the professions overlap, they differ in name only. But engineers' attorney Lewis and McCamy's own attorney both responded that the *Gionti* decision is not controlling because in that suit the fee was billed for architectural services, not engineering services as in McCamy's case.

A strong point for the engineers' side, it would seem, is the fact that the New Jersey architectural registration law contains no definition of the practice of architecture. How can a person be charged with illegal practice, the attorneys ask, if the law does not inform him of the conduct or action which is forbidden? The unspoken undertone to the question is that the architects' law may be unconstitutional on the ground that the elements which constitute the prohibited conduct are not set forth with sufficient clarity so that the average person will be completely informed of those acts which might constitute the criminal offense.

The nub of McCamy's defense, as developed at the first day of the hearing, is that the designs were engineering designs, that there is an inescapable overlap between the two professions as shown by the laws of the various states, educational content in the two professions and by practice and procedure in the exemptions in the registration laws for incidental practice in the other field, and relative ease of securing a license in each others' profession through partial examinations. Attorney Lewis cited a large number of court decisions in other states supporting his contention, particularly emphasizing the Fonde decision in Tennessee in 1952. In that ruling, the court said:

"It is the judgment of this Court that it cannot define and delineate the functions of architects and engineers in such way as to draw a line of demarcation between those which could be successfully applied in practice. . . . It appears as a fact that cannot be seriously questioned that the functions of these two professions . . . so overlap that there is no practical way to draw a clear line of demarcation between the two."

Finally, the engineers' argument is that while there are differences, those differences go only to a restriction on the use of the title (McCamy could not call himself an architect), and a limitation on the engineer designing a structure only for a design function. But, it is contended, if there is engineering in the project, either an engineer or an architect can do the entire design and it must be left to the client to decide which type of practitioner would best serve his purposes.

On the other hand, Dean Arnaud contended that only the architect may formulate the needs of the client and translate them into a building design, using engineers for the portion of the work requiring their knowledge. In short, the architect must always be the coordinator and the space allocator, he argued. This is so even if the building is 65-80 per cent engineering, he insisted under cross-examination. Dean Arnaud testified that McCamy's plans were architectural plans. On one point he apparently disagreed with his attorneys in admitting that there is an overlap between the two professions. He rejected the idea of a 100 per cent overlap, however, stating that the architect alone is competent to plan the structure in terms of the client's needs.

After the close of the protracted hearings, and volumes of expert testimony and detailed reference documents, the special board will issue its opinion. This may end the case if McCamy's position pervails. Or it may signal the start of a similar procedure in the courts if McCamy loses. In either event, the McCamy case will be a landmark case in developing the future pattern of architect-engineer relations throughout the country.—**End.**

Strictly Business

Personalities . . . **Dr. Samuel Levine** has been appointed to the newly-created post of director of engineering and research for the Defense Products Division of **Fairchild Camera and Instrument Corporation,** Syosset, L. I., N. Y. . . . The appointment of **James C. Bunyard** as district engineer at Atlanta, Ga., has been announced by President **J. E. Buchanan** of **The Asphalt Institute . . . Macauley Whiting** has been named general manager of **Dow Chemical Company's** Midland, Mich., Division . . . **J. C. Pitchford** has been appointed vice president in charge of engineering at **Benson-Lehner Corporation,** Santa Monica, Calif. . . . The **Benjamin E. Beavin Company,** consulting engineers of Baltimore, Md., have announced the addition of **V. B. Bandjunis** to their staff . . . **Charles H. Bredall** has joined the Technical Products Division of **Packard-Bell Electronics Corporation** as senior project engineer, advanced techniques, it has been announced by **John A. Rhoads,** director of engineering . . . **Ralph E. Clarridge** has been appointed manager-measurements laboratory at the **General Electric** Instrument Department, West Lynn, Mass.

Dr. Levine

Two appointments have been announced in the Scaffolding Division of **Waco Manufacturing Company,** Cleveland, Ohio. **Hugh J. Ferguson,** chief engineer for the division, has been named regional sales manager for the Midwest region. He will be succeeded as chief engineer by **Richard C. Mocny . . . Joseph P. Stroz** has been appointed chief engineer of **Strong, Carlisle & Hammond,** a division of **White Sewing Machine Corporation,** Conneaut, Ohio . . . **Harold McDonald** has been elected vice president in charge of manufacturing of the **Mathes Company,** Fort Worth, Tex. . . . The appointment of **M. D. Ayers** as director of engineering of **Kennecott Copper Corporation,** New York, N. Y., has been announced . . . **Spectra Electronics Corporation,** Mount Vernon, N. Y., has announced that **Edward J. Warner** has been appointed to the firm's board of directors. The corporation also has named **Richard A. Bolz** as director of research and **Daniel B. Ventre** as project leader . . . **Newton O. Felps** has been promoted to senior supervising engineer in the Technical Division at **Humble Oil & Refining Company's** Baytown, Tex., refinery.

Mr. Stroz

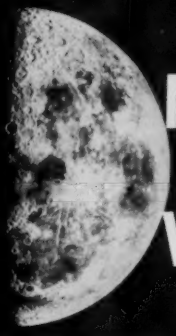
Murray J. Charet has joined the Aircraft Equipment Division of **Consolidated Diesel Electric Corporation,** Stamford, Conn., as a project engineer . . . **Dr. Lloyd P. Smith,** former president of **Avco Research and Advanced Development Division,** and a director of **Avco Manufacturing Corporation,** has joined **Aeronutronic,** a division of **Ford Motor Company,** Newport Beach, Calif. . . . **Research-Cottrell, Inc.,** Bound Brook, N. J., announces the election of **Dr. Harry J. White** as a director and **Ralph L. Chamberlin** as secretary of the company . . . **Dr. David S. Weddell,** European technical representatives for **Monsanto Chemical Company's** Research & Engineering Division, will become assistant director of development for the company's Overseas Division effective January 1 . . . **Aluminum Company of America,** Pittsburgh, Pa., has announced the appointment of two additional assistant chief power engineers. Named to the positions were **G. A. Eagleton** and **H. H. Gnuse, Jr.** . . . The election of **Carl B. Jansen** as chairman of the board and **William E. Clark** as president of **Dravo Corporation,** Pittsburgh, Pa., has been announced.

Mr. Chamberlin

John R. Morton has been named production engineering manager of the Whittaker Controls Division of **Telecomputing Corporation,** Los Angeles, Calif. . . . The appointment of **David E. Shonerd,** as vice president, engineering, has been announced by **Charles E. Bartley,** president of **Rocket Power, Inc.,** a division of **The Gabriel Company,** Mesa, Ariz. . . . **Theodore Van Zelst** has been elected vice president of **Cenco Instruments Corporation** and a director of **Central Scientific Company,** a **Cenco** subsidiary, Chicago, Ill. . . . **James A. Feeney** and **John H. Smith** have joined the Engineering and Construction Division of **American Cyanamid Company,** New York, N. Y. **Mr. Feeney** has been named project engineer in the Project Engineering Department and **Mr. Smith** has been appointed intermediate general engineer in the instrumentation section of the General Engineering Department . . . **Advance Transformer Company,** Chicago, Ill., has announced the appointment of **Jerry Gatz** as representative in Ohio, (except Cincinnati), Pittsburgh, and West Virginia . . . **Angelo R. Aquaro** and **Martin M. Gross** have opened offices for the practice of architecture and engineering in Philadelphia, Pa.

Mr. Van Zelst

Promotional Aids for



NATIONAL ENGINEERS' WEEK

HERE ARE the basic promotional aids on which to build your Engineers' Week program. These items will give your program coverage in local newspapers, on radio and TV stations, and in civic and group displays. Use these promotional materials to show how engineering progress will affect the decade of the 1960's.

1 ***TV Spot Films:*** A set of three 1-minute and two 20-second TV films dramatizing the theme of the 1960 National Engineers' Week. Produced to meet network standards, the films call attention to the role of the engineer in building for progress through the coming decade. Each film qualified for public service TV time during station breaks. A set of these five films will reach your largest Engineers' Week audience. Price: Set of five films, $25.

2 ***"Engineering's Great Challenge—The 1960's:"*** A 15-minute tape recorded radio program dramatizing the contributions engineering will make during the 1960's. Network performers describe engineering achievements in exploring the moon, in building computers, in medical research, in designing new transportation arteries, in structures, and in many other fields. Excellent for use on public service radio time. Price: $6 each.

3 ***Set of Seven TV Slides:*** Obtain extensive TV coverage through the Week with these slides displaying poster-type art work and printed copy calling attention to engineering. May be used during all TV station breaks as public service announcements. Price: $10 per set of 7 slides.

4 ***Tape Recorded Radio Announcements:*** A set of seven 20-second radio spot announcements, made by a network radio and TV announcer. Offers local stations a top-level recording for 20-second station breaks. Price: Set of seven recorded announcements, $3.50.

5 ***Lapel Buttons:*** A high-quality lapel badge with poster design. Each chapter or state society can set its own price for button sales. Prices: 100 to 500—15c each; 500 to 1,000—10c; 1,000 to 3,000—7c; 3,000 to 5,000—5c; and over 5,000—4c.

6 ***Posters:*** Colorful 9 x 11-inch pasteboard posters carrying the 1960 Engineers' Week design and theme. This is the basic promotional item for calling attention to the Week. Use on bulletin boards, in window displays, school exhibits, etc. Large size (18 x 22 inches) also available. Prices: 9 x 11, $4 per 100; 18 x 22, $5 per 100.

7 ***Paper Banners:*** Excellent for display use. Three feet long by 6 inches wide. Has poster design and words "National Engineers' Week" in color. Price: $4 per 100.

8 ***National Engineers' Week Seals:*** Use these brightly colored seals on all office mail from now through February 27. Poster design printed on 1½-inch gummed paper. Price: $3 per 1,000.

9 ***Newspaper mat story on engineering and the exploration of the moon during the 1960's:*** A feature article on how the exploration of our moon will be an engineering accomplishment from the rocket vehicles, through the instruments and structures landed on the lunar surface. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price .75 each.

10 ***Newspaper mat story on the engineering achievements expected in the decade of the 1960's:*** A feature article on engineering progress, based on the engineering "breakthroughs" of the 1950's. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price .75 each.

11 ***Logotype:*** A metal cut of a poster design to insert in advertising, special sections of newspapers, industrial house organs, magazines, and other printed matter. All state society and chapter publications should have one. Price: $1 each.

12 ***"Engineering . . . for the Age of Space:"*** A re-issue of the 15-minute tape recorded radio program distributed last year. Excellent for use on public service radio time. Price: $4 each.

→ *Use this coupon to order your aids now!*

National Society of Professional Engineers
2029 K Street, N.W./Washington 6, D. C.

Sirs:

Please rush me items indicated. I enclose a check ☐ money order ☐ in the amount of $.....

I understand remittance must accompany order.

NAME _____
Please Print

ADDRESS _____

CITY _____ STATE _____

1._____TV Spot films @ $25 per set.
2._____Radio tape "Engineering's Great Challenge—The 1960's" @ $6 each.
3._____TV slides: set of 7 slides @ $10 per set.
4._____Recorded spot announcements @ $3.50 per set.
5._____Lapel buttons: 100-500 @ 15c ea.; 500-1,000 @ 10c ea.; 1,000-3,000 @ 7c ea.; 3,000-5,000 @ 5c ea.; over 5,000 @ 4c ea.
6._____Posters: regular size @ $4 per 100.
_____Posters: large size @ $5 per 100.
7._____Banners @ $4 per 100.
8._____Seals @ $3 per 1,000.
9._____Newspaper mat stories on engineering and the exploration of the moon @ .75 ea.
10._____Newspaper mat stories on engineering achievements in 1960's @ .75 ea.
11._____Logotypes @ $1 ea.
12._____Radio tapes "Engineering . . . for the Age of Space" @ $4 ea.

Pres. Eisenhower Salutes '60 Engineers' Week in Message

A message from President Eisenhower concerning the observance of the 1960 National Engineers' Week has been received by the National Society.

In a communication to NSPE President Harold A. Mosher, Mr. Eisenhower declared that "it is fitting to salute the contributions made by the engineering profession to America's technological development."

The President cited the theme for the 1960 observance as pointing to "the demands of the coming decade." He added that "the unprecedented requirements for excellence, for high performance, and for public service must be met if we are to continue to grow in scientific achievement. In encouraging our young people to prepare for careers in science and engineering, we strengthen the base for further advances."

Reproductions of the President's message on White House stationary are available in bulk amounts, at no charge, from the National Society headquarters. Copies of the reproduction were sent to all local chapters and state societies with an issue of the Engineers' Week Action Letter. The reproductions may be used by local Engineers' Week committees for mailings to industrial executives, engineering schools, government agencies, newspapers, magazines, industry house organs, and other publications. The reproductions of the President's message have also been used extensively in window and other displays, and in local newspaper advertisements in special sections published during Engineers' Week.

Advance planning for the 1960 observance went into the final stages this month in many local chapters and state societies. A considerably increased amount of cooperation in the events of the 1960 Week was indicated by other engineering groups. The American Society of Mechanical Engineers, for example, has offered the cooperation and support of its sections throughout the country. A list of NSPE chapter presidents was reproduced by ASME and was distributed to all ASME sections. ASME representatives are contacting NSPE chapter presidents to offer to participate in the local Engineers' Week activities.

The Texas SPE has prepared and distributed a 14-page Engineers' Week handbook for all chapters in that state. The handbook suggests and outlines a comprehensive program for Texas chapters.

A complete listing of promotional aids available from the National Society headquarters, with prices, appears on the adjoining page. Orders for this material should be placed as soon as possible.

Space exploration, electronics, nucleonics, and other technological developments currently in the news are featured in the set of five spot films produced for use on public service time during Engineers' Week. The films were made in 35-mm for distribution to major network TV programs during the week of February 21-27. ►

1960-61 Nominees Are Announced

A TEXAS MAN, who has played a prominent role in the activities of the National Society, has been selected by the NSPE Nominating Committee to head the 1960-61 slate of candidates for national office. Noah E. Hull, of Houston, Texas, has been nominated for the presidency, the Committee has announced.

Noah E. Hull

Vice Presidential nominees chosen by the Committee are: W. Earl Christian, of New Brunswick, New Jersey, Northeastern Region; R. King Rouse, of Greenville, South Carolina, Southeastern Region; Benjamin G. Elliot, of Madison, Wisconsin, Central Region; Brandon H. Backlund, of Omaha, Nebraska, North Central Region; Thomas T. Mann, of Roswell, New Mexico, Southwestern Region, and John H. Stufflebean, of Tucson, Arizona, Western Region. Messrs. Christian, Rouse, and Backlund are nominated for a second term. Nominated for a thirteenth term as treasurer is Russell B. Allen, of College Park, Maryland.

In announcing the names of the candidates, the Committee pointed out that additional nominations may be made by members as provided by the NSPE Constitution. Other names will be placed on the official ballot upon petition of fifty members, all in good standing, provided such petition is received at least one week prior to the printing of the ballot. The closing date for such petitions, which should be sent to the national headquarters in Washington, D.C., is January 10, 1960.

Members of the Nominating Committee are: Garvin H. Dyer, chairman, Clarence H. Evans, Fred M. Johnson, William F. Moehlman, John L. Pratt, and Frederick Von Voigtlander.

Noah E. Hull, nominee for 1960-61 president, is vice president and general manager of the Hughes Gun Company and assistant to the vice president - manufacturing of the Hughes Tool Company. Born in Mark Center, Ohio, he received his Bachelor of Science degree in civil engineering from Purdue University in 1917. Prior to his present post he held executive engineering positions with the General Motors Corporation, the Firth Carpet Company, and the National Gypsum Company.

A registered professional engineer in three states—Michigan, New York, and Texas—Mr. Hull has also been active in the San Jacinto Chapter and the Texas SPE. He is a past national director of NSPE and is a former chairman (1955-58) of the Professional Engineers Conference Board for Industry. He is a member of a number of other professional and civic organizations, including the American Society of Civil Engineers.

W. Earl Christian

W. EARL CHRISTIAN, of New Brunswick, New Jersey, vice presidential nominee for the Northeastern Region for a second term, is chief engineer for the Hefler-Snyder Company, of Garwood, New Jersey. He studied in the College of Engineering, University of Illinois, 1916 to 1918, and served with the Corps of Engineers in World War I. He spent about thirteen years with the New Jersey State Highway Department.

During the past twenty-five years, he has been engaged in the contracting and construction field.

Mr. Christian is a past president of the Raritan Valley Society of Professional Engineers, and is a past president of the New Jersey SPE. He has served the National Society as a member of the Policy Review Committee, the Constitution and Bylaws Committee (three years as chairman), and is presently chairman of the Budget Committee.

R. King Rouse

R. KING ROUSE, of Greenville, South Carolina, vice presidential nominee for the Southeastern Region for a second term, heads the R. K. Rouse Company in Greenville, representing several manufacturers of heating and cooling equipment. He organized the firm in 1938. His academic and technical education was secured through attendance at schools in his home State and included the study of mechanical engineering at the Georgia School of Technology in Atlanta, Georgia.

He has been a member of NSPE since 1943 and was active in organizing the South Carolina Society, being its first president in 1948 and served as national director from 1951 to 1957.

Mr. Rouse holds membership in Rotary, Toastmasters, and other local and national organizations, including the Society of American Military Engineers and American Society of Heating, Refrigeration and Air - Conditioning Engineers, being elected to the 1959-60 National Nominating Committee.

Benjamin G. Elliot

BENJAMIN G. ELLIOT, of Madison, Wisconsin, vice presidential nominee for the Central Region, is emeritus professor of mechanical engineering at the University of Wisconsin. A mechanical engineering graduate with B.S. and M.S. degrees from Rose Polytechnic Institute and a M.E. degree from the University of Wisconsin. Professor Elliott became associated with engineering education in 1913 at the University of Wisconsin.

After a short teaching stay at the University of Nebraska, he returned to Wisconsin. He served as chairman of the Department of Mechanical Engineering from 1947 until this year.

A past national director of NSPE for three terms, he has also been very active in other organizations, including the American Society for Engineering Education, American Society of Mechanical Engineers, and the National Association of Power Engineers. He has received the Iron Ring of the Calling of the Engineer from the Engineering Institute of Canada, the ASME Diamond Jubilee Award, and the Citation of Merit from the Wisconsin State Utilities Association.

Thomas T. Mann

THOMAS T. MANN, of Roswell, New Mexico, vice presidential nominee from the Southwestern Region, heads the Mann Engineering Company in Roswell. Born in 1908, he received a Bachelor of Science degree in civil engineering from the New Mexico College of Agriculture and Mechanic Arts in 1929. After graduation he was employed by a New Mexico consulting firm for three years, and then joined the New Mexico State Highway Department. He remained in the latter post until 1941 when he started service with the United States Corps of Engineers.

Following four years in the Corps, he became superintendent of construction for New Mexico Highway Contractors. He served for two years as city engineer for the City of Roswell before establishing the Mann Engineering Company in 1950.

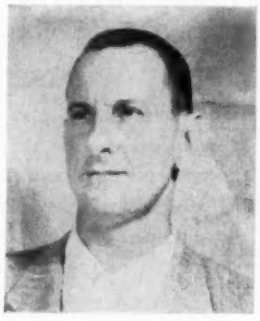
Mr. Mann has served as president of both the Southeastern Chapter and the New Mexico SPE, and is currently a national director of NSPE. He is also chairman of the Society's Membership Committee and serves on the Engineering Practices Committee.

Brandon H. Backlund

BRANDON H. BACKLUND, of Omaha, Nebraska, vice presidential nominee for the North Central Region for a second term, is presently the head of a firm of consulting engineers and architects in Omaha. He received his civil engineering education at the University of Nebraska and at Iowa State College where he received his B. S. degree in civil engineering in 1941. He has also had postgraduate training in various Army service schools during World War II.

Prior to World War II, he worked with several engineering and construction firms in capacities of engineer, estimator, and consultant until April of 1951 when he opened his own practice in civil and structural engineering. He is one of the founders and a past president of the Nebraska SPE. Mr. Backlund has been active as a member of the Board of Directors and in committee work since the Society was chartered.

He is a member of ASCE, SAME, AWWA, ACI, and the Nebraska Engineering Society. His other activities include membership and committee work in various civic and service groups.



John H. Stufflebean

JOHN H. STUFFLEBEAN, of Tucson, Arizona, vice presidential nominee for the Western Region, is chief engineer for Blanton & Cole, Architect-Engineers. Born at Brookfield, Missouri, in 1918, he received his Bachelor of Science degree in civil engineering from the University of Missouri in 1945. He started his professional career with the Missouri Highway Department in 1940, joining the C.B. & Q.R.R. at Galesburg, Illinois, in 1941.

Following duty with the Field Artillery and U.S. Corps of Engineers as a lieutentant during World War II and his return to complete requirements for his degree in 1945, he moved to Arizona with the S.P.R.R. at Tucson.

Charter president of the Southern Chapter in 1949, he has served as secretary-treasurer and president of the Arizona SPE, as well as being a national director of NSPE. He is currently a member of both the Society's Engineering Practices Committee and Public Relations Committee.

Mr. Stufflebean is registered in Arizona, Missouri, Texas, and New Mexico.

(Continued on page 39)

Thoughts on Professionalism...

By PAUL H. ROBBINS, P.E.
NSPE Executive Director

QUO VADIS

Q*uo Vadis*—Where are you going?

EVERY professional engineer several times during his career asks himself this question. He will attempt to look at himself from a detached point of view and assess his future. He will analyze his potential from several aspects—where is he going as an individual, where is he going as a member of the profession, and where is he going as a member of his professional society?

AS AN individual he quickly recognizes his need to advance in his branch of technical competence and, in addition, in his professional development. He will take advance training; he will read technical literature; and, if expecting to be completely competent, he will support and be active in his technical society.

TOO many engineers, however, feel it is someone else's job to participate and actively support the professional programs that will not only enhance the profession but bring stature and reward to him personally. These are the same people who complain that engineers are not accorded the status to which they are entitled, or the recognition that should be accorded the profession in relation to its contribution to the economy.

THEY fail to recognize that the status of the profession is the composite of the status accorded each individual member of the profession. If they do nothing to enhance the professional standing of the profession, the status of the profession suffers. It is disturbing to note in the study "Career Satisfactions of Professional Engineers in Industry" that only about one-third of those surveyed were members of any civic organization or service club, slightly over half were members of any professional society, and of those that were members, less than fifty per cent admitted to being active.

IF ENGINEERING is not accorded the recognition we think it should receive, we have only ourselves to blame. Each member of the Society can analyze his own contribution to the profession—not in terms of technical excellence alone but in terms, as Dr. Wickenden said, of "that mile of unrequited service to the common good . . . by which a calling can attain the dignity and distinction of a profession."

How much have you participated in the work of your Society?

How many meetings have you attended?

How familiar are you with the programs being accomplished for you by others in the Society?

Q*uo Vadis*—Where are you going?

General Minton to Talk At NSPE Winter Meeting

Major General A. M. Minton, director of engineering for the United States Air Force, has been announced as a guest speaker for NSPE's winter meeting in Wichita, Kansas, February 18-20.

General Minton, an ardent supporter of engineering registration, has long encouraged engineers to join professional and technical engineering organizations. He is scheduled to talk to members of the National Society at a 12:30 p.m. luncheon on February 19.

General Minton

After receiving his B.S. degree from the College of Engineering at the University of Illinois in 1929, he obtained an M.S. degree from the Graduate School of Business at Harvard University.

Following various assignments, the general moved to Air Force headquarters in Washington, D.C., in 1957 where he was assigned to his present position. As director of civil engineering he is responsible for all construction matters for the Air Force. This includes an annual expenditure of some one billion dollars for new construction; nearly one billion dollars spent annually for the maintenance and operation of Air Force facilities; the supervision of a military housing program valued in excess of one billion dollars, and the acquisition, management and disposition of real property and facilities now valued at 10.7 billion dollars.

Guy M. Shelley, Jr., vice president of the Kansas Engineering Society and general chairman for the winter meeting, reports that final program plans are rapidly being completed and will be available for the January issue of the AMERICAN ENGINEER.

CLASSIFIED ADVERTISING

Minimum 3 lines.
Undisplayed, $1.80 per line. Three or more consecutive insertions $1.50 per line each.
Displayed: Same rate as General Advertising.

Positions Wanted: Undisplayed, 90¢ per line. Three or more consecutive insertions 75¢ per line each. Displayed: General Advertising rates, less 50%.
Box Number chargeable as one line.

Mail Box Number replies to:
AMERICAN ENGINEER
2029 K Street, N.W. Washington 6, D.C.

Positions Wanted

Chemical Engineer, B.S. Ch.E. 1951, P.E., Texas. Veteran, single, age 33. Experience in petroleum—field and laboratory testing. Desire research, development or routine analysis. Box 1001, AMERICAN ENGINEER.

Mechanical Engineer, B.S., P.E. Penna. and La., age 38, experienced in instrumentation, industrial plant design, and facilities planning. Prefer La. or Texas. Box 1002, AMERICAN ENGINEER.

Electrical Engineer, 32, registered, nine years experience in design of heavy industrial electrical installations, indoor and outdoor distribution, and motor control. Knowledge of Spanish. Desires employment in Latin America. Box 1201, AMERICAN ENGINEER.

Electrical Engineer, B.S. in E.E., P.E., age 52. Experienced in transmission, distribution design and cost estimating. 15 years with same company. Prefer South or West. Box 1202, AMERICAN ENGINEER.

Positions Available

Electrical Engineer, experienced in highway lighting and qualified to design and approve highway lighting specifications and plans. Box 1200, AMERICAN ENGINEER.

SALES MANAGER—FANS

Manufacturer of fans looking for M.E. experienced all phases mechanical draft fan design and selling for administrative position with unlimited opportunities for salary and management growth. Send resume and salary requirements. Write Box 1203, AMERICAN ENGINEER.

An Office Engineer (Mechanical) is needed by the City of Jacksonville, Florida. Interested registered professional engineers of the State of Florida have until the end of the year to file an application with the City Civil Service Board, offices located in the Utilities Building, 34 South Laura Street. Requirements: Must be registered professional engineer of the State of Florida; college degree in mechanical engineering from an accredited engineering school. For equivalency in experience and/or completion of courses, write for particulars. Nonresidents having Florida Engineering Registration may apply. Age requirements 25 to 44. Must pass medical examination. The position carries opportunities for promotion on a competitive basis. The starting salary is $7800.00 annually.

ENGINEERING INSPECTOR

Excellent opportunity for man with broad and thorough background to supervise a team of engineers and inspectors for a large and unique research project. Must be able to relocate to Middle Atlantic states. Degree and experience necessary. Salary open. Send resume to Box 1204, **AMERICAN ENGINEER.**

Positions Available

SPECIFICATIONS WRITER

BUTLER MANUFACTURING COMPANY, MULTI-PLANT WORLD LEADER in manufacture and sales of a broad line of pre-engineered buildings and other durable capital equipment is seeking capable Specifications Writer to prepare material specifications for metals, plastics and components used in the manufacture of pre-engineered buildings. Employment in headquarters Engineering Department of Buildings Division.
College training in Chemical, Mechanical or Civil Engineering preferred. Experience in and familiarity with ASTM and Commercial Standards and Federal Specifications desirable. Considerable knowledge of metallurgy and metals needed.
Salary in line with experience and ability. Advancement by merit. Residence in corporate headquarter city, Kansas City, Missouri. Progressive and liberal compensation and benefit plans.
Send full information on personal and work history to Mr. Orval W. Groves, Employment Supervisor, 7100 East 13th Street, Kansas City 26, Missouri.

Butler Manufacturing Company

AULT

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personnel to participate in professional and technical societies. Company policies provide for three different types of participation in these societies: (1) company membership; (2) company initiated membership, and (3) individual membership. The company and company initiated memberships pertain to those technical societies in which the company would have a direct or intrinsic interest such as the National Fire Protection Association. The company also promotes participation in other society activities on an individual basis. The official company policies state that "Automatic Sprinkler is anxious to encourage you to become a member and participate in professional or technical organizations . . . expenses and time off for participation for company authorized activities of the societies will be provided."

It's a little difficult to make a direct comparison, but I think generally professional development becomes more of an individual responsibility in the small company than in a large company.

I don't think there are any great differences in salaries, fringe benefits, and general working conditions. I think these are areas which both the small and large companies realize must be kept at a high level if they are to attract top grade engineering personnel.

In summary, both the large and small industry offer their own peculiar advantages for the engineer. I think the smaller company has some big advantages on its side; and I'm sure the engineer in the larger company can present some equally strong arguments for the advantages of his size organization.—**End.**

NOMINEES

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RUSSELL B. ALLEN, of College Park, Maryland, nominated for a thirteenth term as treasurer, is assistant dean of engineering at the University of Maryland. A professor of

Russell B. Allen

civil engineering, he has also served as head of that department, and acted as coordinator for the design, construction, and equipment of the new buildings of the Glenn L. Martin Institute of Technology of which the engineering college is a part.

A native of New Haven, Connecticut, he received his B.S. degree at Yale where he served for five years as an instructor in civil engineering while taking graduate work in structural engineering and architecture. He spent several years as a construction engineer with the Boston and Maine Railroad and was also engaged in private practice before going to Maryland in 1933.

He was instrumental in getting an engineering registration law passed in Maryland and was a founder of the Maryland SPE, serving as its first secretary-treasurer, its second president, and several terms as national director.

MONSEES

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c. *Judgment*—Ability to separate the "wheat from chaff." An adequate command of the facts, reasoning power, and capacity to exclude bias, emotions, and temperament.

d. *Ability to Communicate*—Simple, clear presentation of analysis and solution. Transmission of thoughts in a clear orderly manner. Ideas and plans must be given to others, verbally or in writing, in order to benefit mankind and posterity.

e. *Analytical Power*—Ability to follow cause and effect relationships to break down problems into their simpler and more manageable components.

f. *Mathematical Ability*—Important to engineering ability and an asset in supervising design, statistics, linear programming, estimating and other functions which are related and important to an executive engineer's activities.

g. *Ability To Think With Symbols* – Essential in mechanics, chemistry, etc.; however, this quality possibly may tend to be a liability to a supervisor when he turns to the solution of abstract problems, human relationship, and competitive strategy.

h. *Temperament* – Should fall somewhere between extroverts and introverts.

i. *Productivity*—Combination of good planning, disciplined effort, perseverance, stamina, resistance to distraction, energy and judgment. This asset is very necessary to the engineering executive and construction manager.

j. *Observation*—An ability that distinguishes good engineers from average ones. Strength in technical observation often seems, in fact, to lead to weakness in observation of people. Observation of people and the job is vital to an engineering executive and construction manager.

k. *Clerical Aptitude*—Gift of recognizing, interpreting and utilizing voluminous data and figures. Essential that construction managers be cost conscious at all times. The company must make a profit in order to stay in business.

l. *Leadership*—Ability to work harmoniously with other people *plus* the ability to lead and direct these people in problem solving and most important of *getting the job done.*

m. *Courage*—The ability to make decisions on the basis of often incomplete information. (The criteria of making every effort to obtain complete information is, of course, very important, especially in a profession like engineering).

n. *Integrity*—There is no place for careless, slipshod, or dishonest decisions in the engineering profession. This quality serves the executive.

It is not easy to become an effective leader. The position presents many problems. A person aspiring to be a leader, an executive engineer, or construction manager must develop and increase his ability to make decisions, motivate people, exercise control, assume responsibility, inspire confidence and deal squarely with all people. In addition, he must adjust and adopt his operation in the light of those factors which limit his authority and responsibility. Such factors within the span of control, are "the boss," the setup of the organization, channel of command, the work force, the fellow supervisors, regulations, and policy. In order to operate effectively within these limitations, a professional engineer should be able to analyze a situation and estimate the degree of each of the limiting or controlling factors. He should be capable of studying the nature of the limitations and decide to what extent he can change or improve them and to what extent he must accept them and accommodate his operations to them.

In the final analysis, "the successful leader (or executive engineer) is one who, when circumstances beyond his control prevent him from doing what he thinks is best, can figure what is next best and do it with the same vigor and enthusiasm as if it was his first choice."[11]—**End.**

[11] McLarney, William J., *Management Training* (Richard D. Irwin, Chicago, 1952), p. 289.

to Remember

Louisiana Engineering Society—Annual Meeting, January 7-9, 1960, St. Charles Hotel, New Orleans, Louisiana.

Professional Engineers of North Carolina—Annual Meeting, January 21-23, 1960, Raleigh, North Carolina.

Texas Society of Professional Engineers—Annual Meeting, January 21-23, 1960, Harlingen, Texas.

Mississippi Society of Professional Engineers—Annual Meeting, January 21-23, 1960, King Edward Hotel, Jackson, Mississippi.

National Society of Professional Engineers—Winter Meeting, February 18-20, 1960, Broadview Hotel, Wichita, Kansas.

National Society of Professional Engineers—Annual Meeting, June 8-11, 1960, Statler Hotel, Boston, Massachusetts.

About the Author . . .

Mr. Monsees

Melford E. Monsees is a native of Missouri. His entire professional career of more than twenty-five years has been with the U. S. Corps of Engineers. Currently, as a supervisory civil engineer, he is chief of the Program Development Branch of the Kansas City District, U. S. Corps of Engineers with responsibility for detail and long-range programming of water resources development projects, and for mapping, drafting and office engineering in this engineering district which covers portions of the States of Missouri, Kansas, Nebraska, Iowa, and Colorado.

His academic training was obtained at Central Weslevan College, Colorado State University, University of Kansas City, and the Massachusetts Institute of Technology. Additional research and study at M.I.T., just recently completed, was provided by a Secretary of Army Fellowship. This fellowship was awarded for past achievements and for development of a creative plan for study and research.

He is active in the Western Chapter of the Missouri Society of Professional Engineers and has served as a member of the Chapter's board of directors.

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By Mrs. Garvin H. Dyer, Chairman of the Ladies Auxiliary Advisory Committee.

Several new auxiliaries have been organized. The wives of the South Central Chapter of Idaho, which comprises an area about fifty miles in diameter around Twin Falls were organized last spring. While members are scattered, and have to drive some distance to meetings, it is a very interested and enthusiastic group. They planned activities for visiting ladies at the state meeting in the spring. Mrs. Thomas H. Curtis is the president.

Mrs. Tobias Koch writes that the Women's Auxiliary to the Philadelphia Chapter had their "Get Acquainted Tea" last April. They had an attendance of fifty-five. Mrs. Koch was elected president.

The wives of the Mississippi Society organized in July. They plan to meet twice a year concurrently with the men's meeting, thus promoting attendance for both groups. Mrs. Arthur C. Miller of Jackson was elected the first president.

The Bronx Chapter Auxiliary of New York held its first meeting of the year in September and made plans for the annual dinner dance which was held November 21. They report presenting scholarship awards to two engineering schools in Bronx County, the New York University School of Engineering and the Manhattan School of Engineering, in the amount of $50 each. They hope to increase the amount of their awards this year.

The Oklahoma State Auxiliary report that they give a scholarship in the amount of $300 each year, rotating between Tulsa University, Oklahoma University, and Oklahoma State University.

The Auxiliary to the South Piedmont Chapter of North Carolina has given a scholarship to a student of engineering at N. C. State for quite a few years. In order to raise the money this year they had a delightful party that was also a financial success. A Dessert Bridge and Fashion Show was given in October.

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Progress in Products

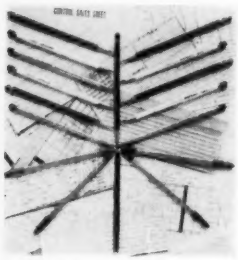
STREET CLEANER — Item 30

A vapor spray system that moistens all dust, dirt and debris as they are cleaned from the street by a powerful vacuum system, has been developed by the Baughman Manufacturing Company. By means of controlled moisture introduced into the blower, all street dirt becomes heavy and coarse. It loses its powdery consistency immediately and when carried by the ductwork into the truck body it stays there.

METAL PRIMER — Item 31

Krylon Rust Magic metal primer, new metal primer—spray or brush type—that dries in twenty minutes, and is compatible with almost any finish coat, has been announced by Krylon, Inc. The metal primer contains a special phenolic resin penetrant which carries the pigment and vehicle through sound rust and locks itself tight to the substrate. This complete penetration seals the surface, locks out moisture and prevents further rust development. This saturating action neutralizes porous rust and makes it an actual ingredient of the paint film, it is claimed

WRITING TOOLS — Item 32



New writing instruments especially designed for the age of office automation are being marketed by the Eberhard Faber Pencil Company. Both special pencils and ball pens are being made available not only for the newer office reproduction devices, but also for the electronic data-processing cards. Some make markings that are electrical conductors, where required.

GRID BOARD — Item 33

Electronic designers can now make, and remake, their own high quality printed circuit layouts—without leaving their labs—with a new product made by Corning Electronic Components. It is a Fotoceram grid board, designed by Corning as a valuable tool for prototype work. It is clad on both sides with copper that can be etched away as desired. The grid for installation of components consists of .052-inch round holes spaced 1/10-inch apart on center. No special equipment is needed to use the board.

SHEET PACKING — Item 34

A new line of compressed asbestos sheet packing has been announced by Union Asbestos and Rubber Company. This packing is designed primarily as a gasketing material for a wide variety of industrial uses. The packing is available in eight basic grades in standard size sheets including: commercial, intermediate, Navy, premium, neoprene, premium neoprene, and blue asbestos.

NYLON FILM — Item 35

Extruded nylon film in a variety of thicknesses is currently being marketed by the United States Gasket Company. The new product possesses all of the chemical, physical and mechanical properties of nylon, making it useful to a wide variety of industries. The nylon film and sheet is now being offered in thicknesses from .002″ to .060″ and in widths up to 18″. The material is grease, abrasion and vapor resistant, has a low coefficient of friction, a low permeability factor, and it can be steam sterilized, according to the manufacturer.

COMPARATOR — Item 36

A convenient slide rule comparator, listing complete details on office copying machines made by ten different manufacturers, is available free from Minnesota Mining and Manufacturing Company. Designed to aid the prospective purchaser in his selection of the proper copying equipment, the comparator contains information on machine and paper costs, types of copying processes, number of copies possible per minute, number of processing steps as well as details on nine other categories.

FLAGGING TAPE — Item 37

A new, versatile plastic flagging tape has been introduced by Keuffel & Esser Company. Made of tough, vinyl plastic in five vivid colors, it acts as a high-visibility marker for identification purposes. Its uses include locating boundary lines, stakes, stations, landmarks, center lines, property and utility lines and danger areas. The weather and wind-resistant tape tears clean, takes pencil and ball point pen markings and remains supple at temperatures as low as minus thirty degrees F., it is claimed.

This column describes new products of general interest to professional engineers. For further information, circle the item number in the Readers' Service Dept. and mail to AMERICAN ENGINEER.

These listings are informational and are not an endorsement of the products, nor of the manufacturer's claims.

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